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## A Science and Technology Research University for the 21st Century - Final Self-Study Report

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*A Science and Technology Research University for the 21<sup>st</sup> Century*

New Jersey Institute of Technology

Final Report

Submitted February 16, 2012

Decennial Review April 1-4 2012

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*Prepared for the*

Middle States Commission on Higher Education ♦ Reaccreditation 2012

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## EXECUTIVE SUMMARY

The following is an executive summary to *A Science and Technology Research University for the 21<sup>st</sup> Century*, the self-study prepared by the New Jersey Institute of Technology (NJIT) community for the Middle States Commission on Higher Education (MSCHE). The executive summary offers highlights of the self-study and describes the process used to produce this final report.

NJIT is a mission-driven institution. As New Jersey's science and technology research university now in its 131<sup>st</sup> year, NJIT has played an important role in the state, region, and nation in its pursuit of education, research, economic development, and service. During the era of industrialization in American post-secondary education, Newark Technical School was founded (1881), degree granting authority was granted (1923), and the school's name was changed to Newark College of Engineering (1930). In an era of expansion, the university was transformed to augment its research mission and was renamed New Jersey Institute of Technology (1975).

During the financial crises of 2008 and 2011, NJIT has been able to make substantial gains for its shareholders—the various constituents who share and contribute to the university's processes and outcomes—due to its mission-centered focus. A valid way to put these gains in context is to review *A Science and Technology Research University for the 21<sup>st</sup> Century* within the framework of evaluations presented by the Middle States Commission on Higher Education in the decennial 2002 review and the 2007 periodic review report. The 2002 visiting team noted the “remarkable role” that NJIT played, making “extraordinary progress” under the leadership of Saul K. Fenster, the university's president from 1978 to 2002. The visiting team noted the university's strength in measurement, long-range planning and resource allocation, engaged faculty, and assessment of student learning. In addition, the visiting team presciently cautioned the future would compel difficult choices that would have to be weighed for their strategic importance. By the time of the periodic review report in 2007, those choices had been made. Systematic global disruption would validate the visiting's team prudence. A new president, Robert A. Altenkirch had arrived in 2002 and continued in the NJIT tradition of prudent strategic planning through his departure in November of 2011 to assume the presidency at the University of Alabama in Huntsville. In his inaugural address to the NJIT community on September 25, 2002, President Altenkirch emphasized congruence between NJIT's growth and adherence to the accreditation standards of the Middle States Commission on Higher Education. Augmenting a crisp and focused strategic plan with measureable goals and a transparent scorecard, President Altenkirch promoted assessment as a vehicle for enriched institutional context and strengthened educational effectiveness. In 2007, the Middle States reviewers documented the strength of that vision as “true to the university's history.” “Successful realization of NJIT's goals,” the reviewers wrote, “will benefit all of higher education.”

Realization of these goals continued under Joel S. Bloom, appointed as Interim President of the university on September 29, 2011. As Vice President for Academic and Student Services and Dean of the Albert Dorman Honors College, Dr. Bloom's twenty years of service to NJIT assured that he was well-positioned to take on this leadership role. On January 9, 2012, Dr. Bloom was appointed President of the University by the NJIT Board of Trustees.

The executive summary portrait of NJIT during the period from 2001-2011 provided below reveals that, in an environment of declining state support, a combination of sound planning and resource allocation has resulted in a pattern of sustainable growth. Offsetting an overall 25% decline in base state appropriations has been a rebound in overall enrollment over the past five years. In fact, fall 2011 enrollments (and first-year students) are at all-time highs. Total

enrollment declined by 10% between 2001 through 2005, primarily due to the dot-com crash. However, implementation of new academic programs and majors, growth in the Albert Dorman Honors College, and other recruitment initiatives have resulted in steady enrollment growth over the past five years. Enrollment of women students is at an all-time high. Awarded bachelors, masters, and doctoral degrees span 124 degree programs as students enrolled in 47 bachelor's degrees, 59 master's degrees, and 19 doctoral degrees. While the number of full-time tenure and tenure-track faculty has decreased slightly, total research expenditures have risen, as have total operating expenditures. Challenges nevertheless remain for a university committed to student diversity and admissions equity.

## Executive Summary Portrait of NJIT: 2001-2011

Metric	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11
Total Operating Expenditures (\$ in Millions)	185.1	188.2	189.6	200.0	204.3	217.1	226.4	233.3	230.7	245.1
Total Research Expenditure (\$ in Millions)	69.1	73.7	75.0	76.9	77.6	88.7	89.6	92.9	92.3	100.5
State Support (\$ in Millions)	68.0	67.4	67	69.4	71.1	68.3	71.1	68.5	67.9	66.1
Tuition Undergrad In-State Annual	6,158	6,758	7,332	7,918	8,472	9,066	9,700	10,500	10,816	11,248
Tuition Graduate In-State Annual	8,066	8,866	9,620	10,390	11,118	11,896	12,730	13,780	14,200	15,052
<b>Applications (FTFTF)</b>	2,772	2,591	2,566	2,538	2,562	2,891	3,027	3,429	4,315	4,398
Women Applicants	23.3%	20.1%	22.1%	21.5%	22.2%	22.6%	23.2%	25.8%	25.2%	27.4%
Acceptance Rate	59%	58%	68%	58%	71%	69%	64%	53%	67%	67%
Yield	44.8%	44.1%	40.0%	45.5%	41.5%	40.4%	35.4%	42.8%	32.2%	29.6%
<b>FTFTF</b>	713	661	698	668	760	798	731	779	926	875
Women	18.2%	17.5%	17.9%	19.6%	17.1%	18.4%	20.2%	20.3%	18.8%	22.2%
Composite SAT	1,143	1,152	1,148	1,152	1,122	1,110	1,138	1,142	1,143	1,141
Retention Rates	80%	80%	85%	80%	82%	80%	80%	83%	84%	81%
Graduation Rates	46%	45%	49%	53%	54%	54%	51%	57%	54%	55%
<b>Enrollment</b>	8,862	8,828	8,770	8,249	8,058	8,209	8,288	8,398	8,840	8,934
Female	2,158	2,137	2,163	1,994	1,839	1,969	1,953	1,999	2,115	2,225
Male	6,704	6,691	6,607	6,255	6,219	6,240	6,335	6,399	6,725	6,709
Minority	1,552	1,603	1,612	1,604	1,621	1,719	1,839	2,040	2,231	2,196
Undergraduate	5,698	5,730	5,712	5,366	5,263	5,380	5,428	5,576	5,924	6,103
Graduate	3164	3,098	3,058	2,883	2,795	2,829	2,860	2,822	2,916	2,831
Bachelor Degrees	812	834	894	997	925	870	949	880	861	907
Master Degrees	914	848	924	891	865	913	855	983	944	959
Doctoral Degrees	66	53	46	69	73	75	52	59	60	67
Full-Time Faculty	381	376	370	379	374	359	352	356	367	367

As documented in the self-study design of April 6, 2010, the NJIT community decided to use the decennial visit of the MSCHE visiting team—along with the *Strategic Plan, 2010-2015*—as an occasion to strengthen and sustain the quality and integrity of NJIT. Embracing the responsibilities inherent in the self-study process is a measure of NJIT shareholder concern for

freedom and quality in higher education; the NJIT self-study has therefore become an occasion to gather evidence in support of the university's present commitment to achieving excellence, to identify remaining challenges, and to define plans for the future.

**The Characteristics of Excellence:** Within an accountability environment established by the Middle States Commission on Higher Education (MSCHE)—as well as the program accreditation demands of the Accreditation Board for Engineering and Technology (ABET), the Association to Advance Collegiate Schools of Business (AACSB), the National Architectural Accrediting Board (NAAB), and the strategic plans of the College of Science and Liberal Arts (CSLA)—NJIT has created an environment of total quality improvement. Suggestions from the 2002 and 2007 reports—along with the many suggestions for improvement from program accreditation reviews—have resulted, as they have been adopted, in an improved campus for the university's six individual colleges and schools: the Albert Dorman Honors College, the College of Architecture and Design, the College of Computing Sciences, the College of Science and Liberal Arts, Newark College of Engineering, and the School of Management.

The chapters in the following report document the NJIT quality improvement environment as it has evolved within the fourteen standards defined in the MSCHE *Characteristics of Excellence*:

- **Chapter 1** analyzes the strategies by which NJIT defines its mission within the context of higher education in the state, region, and nation. NJIT's stated goals—consistent with the aspirations and expectations of a public science and technology research university—have now been articulated in two strategic plans: *Strategic Plan, 2004-2010* and *Strategic Plan, 2010-2015*. As a result of deep mission penetration achieved through its core of nationally recognized programs, improvement in research and intellectual property development, enrichment of the quality of university life, and enterprise resource planning, the mission of NJIT is well known to a wide variety of dedicated shareholders. Combined with strategic planning, identification of the factors impacting mission fulfillment ensures a stable, sustainable future.
- **Chapter 2** analyzes the planning, resource allocation, and institutional renewal achievements of NJIT. Alignment of resource allocation with near-term strategic objectives and long-term goals, combined with processes designed to manage change effectively, assure maintenance of institutional quality.
- **Chapter 3** analyzes human, financial, technical, and physical facilities at NJIT. A historically well-defined resource allocation process demonstrates that the university has continued to achieve its mission despite formidable challenges. Facilities and maintenance projects are planned with an environmental emphasis, where appropriate. As well, the Robert W. Van Houten Library, a key facility for a science and technology research university, is supported in the ever-expanding need for database maintenance and growth. External auditing reveals that the financial reporting of NJIT conforms with U.S. generally accepted accounting principles, and there has generally been an increase in net assets.
- **Chapter 4** analyzes leadership and governance at NJIT. In this chapter, NJIT demonstrates how systematic development and deployment of checks and balances have proven effective in the shared governance model that informs those who lead and govern the institution. Assurance of checks and balances, the defined role of university boards, and wide-spread leadership recognition facilitate the autonomy required for mission fulfillment.
- **Chapter 5** analyzes NJIT's administrative structure and its role in supporting the university's mission. Changes in the administrative structure since 2002 have facilitated



productivity, and formal evaluation of administrative effectiveness has led to increasing improvement in administrative structures and services.

- **Chapter 6** analyzes the means by which NJIT assures institutional integrity through macro and micro level processes. Through initiatives such as the appointment of an Ethics Liaison Officer, revision of the university code of academic integrity, an active Institutional Review Board, and a cohesive framework for fostering diversity, NJIT has been noted by external agencies for its sound, ethically-based leadership.
- **Chapter 7** analyzes institutional assessment at NJIT, a cohesive framework that informs both institutional context and educational effectiveness. Working within *ViSTa*, the NJIT process for strategic planning, the university deploys vision, strategies, and tactics in an accountability system that has now served the university for over a decade. Identified in this chapter are the public and private benchmark institutions NJIT uses to standardize institutional assessment and establish formal comparisons leading to quality improvement. In the spirit of the *MSCHE Characteristics of Excellence*, NJIT strives to achieve coherence between institutional context and educational effectiveness through unified planning and assessment processes.
- **Chapter 8** analyzes student admissions and retention, a function integral to the NJIT mission of excellence in undergraduate, graduate, and continuing professional education that aims to prepare students for productive careers and to amplify their potential for lifelong personal and professional growth. This chapter analyzes admissions standards, goals, and challenges, presenting innovative frameworks for student placement and retention; as well, processes used for undergraduate, and graduate recruitment are analyzed in terms of their effectiveness.
- **Chapter 9** analyzes NJIT student support services. Generous financial aid, uniform course scheduling, student-centered orientation programs, and the Division of Career Development Services operate cohesively to assure that each student has the resources necessary to meet the NJIT Academic Affairs Core Values for students: lifelong learning, community service, leadership, technological application for social good, entrepreneurial inquiry, civility, and diversity. The varied spectrum of student support services, from health services to pre-college programs, assures that student services are equitable, supportive, and sensitive.
- **Chapter 10** analyzes the role of the faculty and instructional staff at NJIT. With superior preparation and career achievements, the excellence of faculty and instructional staff has played a crucial part in the university's ability to achieve mission-fulfillment through shared governance. Portraits of the faculty, with special attention paid to faculty diversity, are presented. Assurance of faculty renewal is evident in mentoring plans and in current plans to hire replacement faculty and instructional staff according to the thematic areas—integrated research and learning in sustainable systems, life and healthcare science, engineering, management, and digital and computing contexts—identified in the *Strategic Plan, 2010-2015*.
- **Chapter 11** analyzes NJIT's educational offerings in terms of their content, rigor, and coherence as assessed in the NJIT Program Approval Process. Required of all undergraduate and graduate degrees, this innovative peer review process assures that, in a sequenced pattern, all NJIT degree programs are analyzed in their ability to articulate and assess the NJIT Institutional Learning Goals: research-based inquiry, ethical conduct, economic opportunity, collaboration and engagement. Combined with the rigors demanded by professional accrediting agencies—the Accreditation Board for Engineering and Technology (ABET) for engineering and computing programs, the Association to Advance Collegiate Schools of Business (AACSB) for programs within the School of Management, and the National Architectural Accreditation Board (NAAB) for

programs within the College of Architecture and Design—educational offerings are designed, offered, assessed, and improved in a well-planned, fully articulated system.

- **Chapter 12** analyzes general education at NJIT as it is achieved through the General University Requirements. This 45-credit cohort of upper and lower division undergraduate courses, proven both effective in delivery and flexible to justified change, has also proven to be an enduring and significant part of the university undergraduate experience.
- **Chapter 13** analyzes related educational activities at NJIT and their unique, mission-centered content, focus, location, and delivery mode. The chapter especially attends to basic skills courses, learning communities, continuing professional education, certification programs, and MSCHE-approved campuses in Beijing, China, and Noida, U.P., India. Special attention is paid to online learning, a hallmark of NJIT, and its use of the *NJIT Framework for Quality Assurance in ELearning* in addressing emerging accountability demands for distance education.
- **Chapter 14** analyzes assessment of student learning, a cohesive framework that informs educational effectiveness within the institutional context. As a member of the Voluntary System of Accountability, NJIT has developed exemplary assessment practices within an integrated assessment system designed to produce rich heuristics regarding student learning and to assure shareholders that students have achieved proficiency in the institution's learning goals and General University Requirement core competencies. This chapter describes that ambitious work-in-progress.

**DESIGN AND PROGRESS OF THE SELF-STUDY:** Self-study is integral to the NJIT mission, and NJIT has now benefitted from two strategic plans: *Strategic Plan, 2004-2010* and *Strategic Plan, 2010-2015*. The current strategic plan is complementary to the decennial review for MSCHE. Because of NJIT's wealth of accredited programs for ABET, AACSB, NAAB—accompanied by the outcomes-driven strategic plans of CSLA—self-study is part of the culture at NJIT.

Launch of the decennial review began on June 3, 2009, with a presentation by President Altenkirch to the Administrative Affairs Council. At that presentation, President Altenkirch explained the resonance between *Strategic Plan, 2010-2015* and the self-study, introducing the basic design to NJIT administrators. On July 9, a memo was released to the NJIT community to announce the launch of the project. Key to the success of the project has been the orientation of rapid assessment for the steering committee, a framework that allowed a process of continuous review of progress and identification of areas in need of attention. Due to the efforts of the Rapid Assessment and Steering Committee (RASC), deadlines have been consistently met and submitted work has been of consistently high quality.

The progress of the self-study is captured in the following six phases:

- **Phase 1: Approval.** *New Jersey Institute of Technology Self-Study Design: A Science and Technology Research University for the 21<sup>st</sup> Century* was approved by MSCHE on April 6, 2010. The design committed NJIT to a comprehensive review. Because NJIT is ambitious in its goals and aware of its challenges, the Working Groups conducted a thorough accounting and review of every aspect of programs and services, governing and supporting structures, resources, and educational outcomes in relation to the NJIT mission. This focus has allowed the university to produce a comprehensive and meaningful self-study. The RASC has worked with chairs, vice-chairs, advisors, and over 100 full-time teaching staff, administrators, and students to complete the seven working group reports. The university community was fully informed by the use of social media, and our communication process assured a wide review of the working group reports.



- **Phase 2: Identification.** Based on the self-study design document approved in April 2010, the Working Groups gathered key documents and identified research that would need to be undertaken to demonstrate mission articulation. During meetings scheduled in the spring 2010, the Working Groups strategized on how to best answer each charge question, whether by locating an existing document, scheduling an interview, or launching a new study. To help them accomplish this task, the Working Groups stored the documents and completed studies in a digital database, an archive customized for the MSCHE visiting team.
- **Phase 3: Review.** Beginning in the fall 2010 semester, the Working Groups' efforts were bolstered by Dr. Robert Clark, a visiting consultant from the Rochester Institute of Technology who, as Dean of the College of Science, led outcomes assessment efforts and curricular reform. Dr. Clark's guidance was integral in charting the course of the self-study. By the end of October, the Working Groups submitted their document identification and needed studies worksheets; by the end of November, after feedback from the RASC and Dr. Clark, the Working Groups produced their final plans for their reports.
- **Phase 4: Refinement.** The end of November 2010 marked a significant milestone: the Working Groups provided the framework for their chapters in detailed outline documents. At this stage the review and feedback process was augmented by assigning a RASC liaison to each Working Group to provide direct feedback and facilitate collaboration among groups. This holistic, matrix approach was further encouraged by Dr. Clark, who identified areas of collaboration and shared them with each Working Group Chair and Vice Chair. By the end of January 2011, the groups had a final draft of the detailed outline for working group reports in hand.
- **Phase 5: Submission.** The next milestone, drafts and submission of the Working Group reports, unfolded over the spring 2011 semester. With the first draft produced by the end of February, the Working Groups entered a cyclical feedback, review, and revision process with the RASC, punctuated by meetings with Dr. Clark and each team. Out of this process sprang insights on how to focus and polish the chapter reports: the creation of team evaluation and recommendations. In the process of evaluation, the Working Groups listed each standard's fundamental elements as defined in the *Characteristics of Excellence in Higher Education* and evaluated NJIT on how it meets these elements according to the following categories: exemplary, emerging excellence, meets standard, and emerging competency. Recommendations, modeled on the *ViSTa* strategic planning system, required each group to unpack each suggestion in terms of vision, strategy, tactics, and assessment. Team evaluations and recommendations were incorporated into the reports. The final Working Group reports were made available on the Middle States website in June 2011 for the NJIT community to review.
- **Phase 6: Communication.** The Working Group reports, the basis for this final report, were then used by the RASC to create the final report, reviewed on the web by the university community from October 7, 2011, to February 12, 2012. The draft report was submitted to the Team Chair, Robert E. Palazzo, Provost, Rensselaer Polytechnic Institute, in advance of his visit on November 8-10 of 2011. Following comprehensive review, revisions have now been completed, and the document has been made available six weeks in advance of the Team Visit on April 1-4, 2012.

The following document, a product of broad-based collaboration, demonstrates the commitment of NJIT to the pursuit of excellence in all of its mission components.



## Middle States Commission on Higher Education

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Phone: 267-284-5000 Fax: 215-662-5501 [www.msche.org](http://www.msche.org)

### Certification Statement: Compliance with MSCHE Requirements of Affiliation and Federal Title IV Requirements Effective November 8, 2011

New Jersey Institute of Technology

(Name of Institution)

is seeking (*Check one*):  
☐ Initial Accreditation  
☒ Reaffirmation of Accreditation through Self Study  
☐ Reaffirmation of Accreditation through Periodic Review

An institution seeking **initial accreditation** or **reaffirmation of accreditation** must affirm that it meets or continues to meet established MSCHE Requirements of Affiliation and federal requirements relating to Title IV program participation, including the following relevant requirements under the Higher Education Opportunity Act of 2008:

- Distance education (student identity verification)
- Transfer of credit
- Assignment of credit hours
- Title IV cohort default rate


*This signed certification statement must be attached to the executive summary of the institution's self-study or periodic review report.*

The undersigned hereby certify that the institution meets all established Requirements of Affiliation of the Middle States Commission on Higher Education and federal requirements relating to Title IV program participation as detailed on this certification statement. If it is not possible to certify compliance with all requirements specified herein, the institution must attach specific details in a separate memorandum.

☐ Exceptions are noted in the attached memorandum (*Check if applicable*)

  
\_\_\_\_\_  
(Chief Executive Officer)

May 31, 2012  
\_\_\_\_\_  
(Date)

  
\_\_\_\_\_  
(Chair, Board of Trustees or Directors)

May 31, 2012  
\_\_\_\_\_  
(Date)

## CHAPTER 1. NJIT MISSION AND GOALS

**STANDARD ADDRESSED:** This chapter addresses Standard 1 of the *Characteristics of Excellence in Higher Education*: Mission and Goals.

**EXECUTIVE SUMMARY:** New Jersey Institute of Technology is guided by a well-defined and closely monitored strategic planning process. Incorporating institutional assessment processes, NJIT has benefitted by mission depth and shareholder collaboration. Benefits from the *Strategic Plan, 2004-2010* have been substantial; gains from the *Strategic Plan, 2010-2015* have already been realized. Responsive to national, regional, state, and local forces of change impacting the state's technological research university, NJIT has exemplified a commitment to education, research, economic development, and service.

**INTRODUCTION:** Adhering to the institutional assessment framework defined in the *Characteristics of Excellence in Higher Education*, NJIT clearly defines its purpose within the context of higher education and indicates whom the institution serves and what it intends to accomplish. NJIT's stated goals—consistent with the aspirations and expectations of a public science and technology research university—clearly specify how it fulfills its unique mission. As a result of deep mission penetration achieved through a wide variety of dedicated shareholders, the mission of NJIT is widely recognized.

NJIT is a mission-centered university. Informed by a well-defined and closely monitored strategic planning process incorporating institutional assessment processes, the university accomplishes mission depth and shareholder collaboration. Responsive to national, regional, state, and local forces of change impacting the state's technological research university, NJIT exemplifies a commitment to education, research, economic development, and service.

The unique role of NJIT is well established, and the university centers its decisions within our four-fold mission:

- in undergraduate, graduate, and continuing professional education, preparing students for productive careers and amplifying their potential for lifelong personal and professional growth;
- in the conduct of research with emphasis on applied, interdisciplinary efforts encompassing architecture, the sciences, including the health sciences, engineering, mathematics, transportation and infrastructure systems, information and communications technologies;
- in contributing to the state's economic development through the state's largest business incubator system, workforce development, joint ventures with government and the business community, and through the development of intellectual property;
- in service to both its urban environment and the broader society of the state and nation by conducting public policy studies, making educational opportunities widely available, and initiating community-building projects.

Complementary to its mission, NJIT's vision is to become a preeminent science and technology research university known for innovation, entrepreneurship, and engagement. This vision for NJIT is strengthened through the university's core values, analyzed in Chapter 6. The mission, vision, and core values are integral to the evolution of NJIT's history.

In 1881, Newark, NJ, was the ideal setting for a school that would contribute greatly to scientific, economic, and social progress over the next 131 years. A center of industrial innovation in the

region, Newark saw the invention of malleable iron and patent leather. In addition to raw materials and manufacturing facilities, Newark's business leaders and other concerned citizens recognized that continuing prosperity depended on another core element: education. The city was already at the forefront of a national urban trend toward providing free public education at the elementary and high school levels. With virtually all industries demanding greater technological knowledge and skills, Newark Technical School, NJIT's earliest predecessor institution, was founded to meet those needs. In the next 131 years, NJIT's fundamental mission focus on science and technology education would expand to include mission elements of research, the economic development of Newark and New Jersey, and public service to the university's shareholders.

NJIT would continue its urban focus in its mission statement first developed in 1992 and carried forward into the 2002 Middle States Decennial Review. The vision statement was renewed and refined by the NJIT Middle States Subcommittee on Mission and Goals. The statement became more focused and concise, emphasizing the educational, economic development, community service, and cultural vision for the university. Delineation of the mission included statements reflecting the university's long-standing commitment to students and the importance of student success as a core index of university effectiveness. The renewed vision statement was shared with the university community and was established as a guidepost for the development of goals and objectives for the next five to ten years.

**STRATEGIC PLANNING AND MISSION ARTICULATION FROM 2002 TO 2012:** Robert A. Altenkirch, the seventh president of NJIT, joined the university in 2002 and ushered in a focus on institutional goals expressed by, and articulated through, outcomes and their assessment. A culture of strategic planning remains in place under President Bloom. With mission and vision statements as a guide, approximately one hundred individuals from all sectors of the university community worked together to develop the *Strategic Plan, 2004-2010*. This planning process—moving from self-study established in the Middle States review to articulation in strategic priorities and objectives in the next Strategic Plan—is now an established planning framework for NJIT: *ViSta, A Strategic Planning Process for NJIT: Vision-Strategy-Tactics*. (An analysis of the strategic planning process is presented in Chapter 7.) With a strategic plan approved by the Board of Trustees, NJIT set out to determine ways to take the university to its next level of accomplishment while preserving and building upon a century-long tradition of excellence in education.

Stemming from NJIT's mission statement, the following goals were set in place and documented in NJIT's 2007 Periodic Review Report, *The Future's Edge*, to enhance and enrich the quality of life of the university community and to ensure a focus on the student; to increase revenue from private sources; to develop a core of nationally recognized programs; to improve national rankings in research and intellectual property development; and to become nationally recognized for attracting high achieving students from diverse national and international populations. Goals are only effective when they are moved into action. To assure mission penetration through the *ViSta* plan—and, thus, to assure outcomes assessment and a process of continuous quality assurance—the President and the Planning Committee developed five strategic priorities with specific objectives. The university budget was concurrently designed to include dedicated funds intended solely for use in achieving the specific objectives set by these strategic priorities. With widespread participation, the President also established metrics with annual targets to mark progress toward achieving strategic priorities. These summary assessment scorecards were presented in *The Future's Edge* and made publicly available on the university website. The scorecard showed that in the summary areas of community and engagement the university was well ahead of the strategic planning targets. In education,

research, and resources, the university was moving well toward achieving or surpassing the final targets.

In her review of the 2007 NJIT Periodic Review Report, MSCHE team leader Dr. Katherine Mayberry applauded development of an exemplary Strategic Plan that drives resource development and allocation. The response noted that progress toward reaching the strategic and enabling goals of the Strategic Plan was excellent.

On May 29, 2009, the familiar planning process—moving from self-study established in the Middle States review to articulation in strategic priorities and objectives in the next Strategic Plan—began anew. By this time, strategic planning was part of the culture of NJIT—a known way of doing business that had penetrated to the college and department level, as both the *Albert Dorman Honors College Strategic Plan, 2008-2012* and *A Strategic Plan for the College of Science and Liberal Arts, 2009-2014* illustrate. The NJIT 2010-2015 Strategic Plan Steering Committee proposed a vision, strategy, tactics, and metrics to strengthen the mission, vision, core values, value proposition, goals, strategic priorities, and strategic objectives of the university. Acting in resonance with the NJIT self-study for the Middle States Commission on Higher Education, Task Forces proposed defined tactics to be executed to meet the strategic objectives. With approval of the Board of Trustees in September of 2010, the new strategic plan established four strategic priorities: to enhance the quality of academic and campus life for the university and community; to sustain a base of private support; to be nationally recognized for multidisciplinary, thematic core areas of integrated research and learning in sustainable systems, life and healthcare science, engineering, management, and digital and computing contexts; and to be nationally recognized for attracting high achieving students and faculty from diverse populations. The combination makes clear that research and learning are intimately related and that institutional assessment and assessment of student learning are unified under a common framework. (Detailed descriptions of assessment processes are included in Chapters 7 and 14.) To support the new strategic plan and ensure that the mission was articulated through assessment of student learning, Provost Ian Gatley, appointed in the spring of 2010, developed, disseminated, and assessed the NJIT core values, institutional learning goals, and General University Requirement core competencies.

**CORE OF NATIONALLY RANKED PROGRAMS:** An important priority in the *Strategic Plan, 2004-2010* focused on building three programs to national prominence by 2008. Mathematics, architecture and wireless telecommunications were selected because these were programs that already had a level of national visibility. All three areas have demonstrated progress in recent years. The Department of Mathematical Sciences has made dramatic progress toward national prominence. It was ranked 10th in the nation in a 2007 study by Academic Analytics based on faculty scholarly productivity, which includes such factors as books published, journal publications, citations of journal articles, federal-grant dollars awarded, honors and awards. The department currently has one of the most active research programs in the country among mathematics departments, with more than \$2M annually in external support.

The New Jersey School of Architecture, already an established leader in computer-assisted architectural design, has begun a transition to a multi-disciplinary school giving rise to the College of Architecture and Design (CoAD). A BS degree in Industrial Design was added in 2005, and new BA programs were launched: Digital Design and Interior Design in 2008 and Fine Arts in 2009. The College's reputation continues to grow as faculty, students and alumni gain recognition regionally and nationally. The more comprehensive CoAD is especially designed to meet unfulfilled educational needs within the state through the additional program offerings.



In the area of wireless technology, a team of researchers address issues such as privacy and security, interference and jamming, ever heavier user traffic, and rapid transmission of data through wireless networks. Current efforts focus on the concept of cooperative communications for wireless, cellular, sensor, and ad hoc networks. The first strategic priority of the NJIT *Strategic Plan, 2004-2010* was clearly met and exceeded.

**IMPROVEMENT IN RESEARCH AND INTELLECTUAL PROPERTY DEVELOPMENT:** NJIT fosters economic development through enterprise and workforce development and collaboration with government and businesses and through the development of intellectual property. Over the last decade, NJIT has sustained a high rate of growth in research and development across all extensive and intensive measures. In the 2010 Carnegie Classification of Institutions of Higher Education, NJIT placed in the upper quadrant of universities in the Research University High Activity category. Its annual research expenditures in 2011 exceeded \$100M, representing 40% of the university's total budget for that period. Ten-year growth in federal funding (56.5% in constant dollars) using recent national data placed NJIT in the top 100 of all universities. The university has accomplished this growth despite declining federal funding in this period for the disciplines at the core of NJIT's research (engineering, physical sciences, mathematics and computer science) and the elimination of the primary state agency funding academic research. A comparison of significant research metrics against the benchmark peer schools is shown in the Table 1.0. (NJIT private and public benchmark institutions are identified in Chapter 7.) Note that NJIT is above the median in all measures.

The growth in numbers is accompanied by recognition of the quality of our faculty on both an individual level as well as functioning as within a group context. Between 2003 and 2009, thirteen faculty members were awarded NSF-CAREER grants while there had been none in the previous five years. One was recognized with the Presidential Early Career Award for Scientists and Engineers. Newark College of Engineering faculty members are key team leaders in a 10-year National Science Foundation Engineering Research Center that is defining the manufacturing platform technology for nano-pharmaceuticals. Biomedical engineering researchers are completing a five-year cycle of funding for a National Institute on Disability and Rehabilitation Research (NIDRR) Engineering Research Center. In 2010 NJIT assumed leadership in an NSF Industry/University Cooperative Research Center (IUCRR) with Colorado State University that is advancing membrane technology.

The solar physicists at our Big Bear Solar Observatory completed a multi-year construction project to install the world's largest ground-based optical solar telescope. Even with two more years of advanced instrumentation to be added, the telescope has produced the highest resolution pictures of the sun's surface ever seen, creating new insights to the orb's magnetic field structure. A separate team has just been funded to pilot the world's highest resolution radio telescope array dedicated to solar studies, while another team is leading a \$100M space weather satellite development project with Johns Hopkins University Applied Physics Laboratory. Mathematics research tripled as a consequence of the focus of the strategic planning, and the department moved from 49<sup>th</sup> to 36<sup>th</sup> nationally in total R&D expenditures over just three years, 2006-2009.

Research in the College of Computing Sciences has been led by multi-million dollar funding for the work of the Structural Analysis of Biomedical Ontologies Center. This work will find a direct pathway to implementation as NJIT received \$23M, the largest university award in the country, to establish an extension program to assist primary care physicians achieve meaningful use of electronic healthcare record systems. This activity has also catalyzed research in the School of Management. The College of Architecture and Design has also been successful in developing a

funding profile. CoAD expertise in sustainable design has led to a series of US Department of Energy grants to promulgate energy efficient design measures in both retrofit and new construction applications. The team is providing the architectural design guidance to the major US Department of Energy hub grant—the Greater Philadelphia Innovation Cluster—and another team has produced a finalist show home entry in the 2011 Solar Decathlon competition.

As Table 1.0 demonstrates, NJIT's position in all aspects of intellectual property development and commercialization has improved dramatically as a consequence of the strategic focus placed on such activities. The Office of Technology Development (OTD) has been restructured and a new patent policy was released. As a result, invention disclosures have more than doubled from fewer than 30 in 2003 to an average of 80 in the last several years. A key metric universities use to evaluate their intellectual property performance is the number of invention disclosures per million dollars of sponsored research. Over the past four years NJIT's ratio has been 0.90 or better, with the national average at 0.45. License revenue that was perennially no more than \$25K has averaged \$400K over the past seven years.

Increasing research expenditures remains a challenge. The university has met the goal (65) for PhD graduates, now in 14 disciplines, and research expenditures have exceeded \$100M in FY11. The number of commercial licenses and options from university held intellectual property (117) has well exceeded the original target (50). When goals are met, costs often increase. The concept of opportunity cost is not widely understood within the NJIT community; thus, enhanced communication will be needed as planned growth continues.

Since 1988, the NJIT Enterprise Development Center (EDC) has given startups a critical edge in developing, launching and commercializing their ideas. The EDC fosters economic growth in the state, workforce development, development of new technologies, entrepreneurship, sustainable growth, global competitiveness of NJ's businesses, and university access and industry collaboration.

The EDC incubator has launched 85 businesses with a remarkable 5-year survival rate of over 85%. In 2009 alone, the 95 companies in the incubator created more than 300 jobs, employed about 100 students, and posted combined revenue of \$40M. Companies in the EDC have attracted a cumulative investment of approximately \$58M. The National Business Incubation Association awarded its Soft Landings International Incubator designation to the EDC in 2010 in recognition of the EDC's work in providing services for nondomestic firms and its success in helping these firms enter the U.S. market.

Table 1.0. Research and Intellectual Property Metrics Compared to Benchmark Peers

NAME	Carneg. Class	STEM PhD	STEM RD Exp \$K	RES Staff	RD Inc. 99-08	PhD/ Fac	RD Exp/Fac	No. Discl.	Disc/ \$M	US Pat. Filed	Lic. & Opt.	Lic. Inc. \$K
Auburn University Main Campus	RU/H	94	141,158	181	75%	0.08**	119	87	0.62	80	15	693
Clemson University	RU/H	103	182,162	43	83%	0.10	169	77	0.42	64	13	2837
Colorado School of Mines	RU/H	46**	34,044	62	57%	0.14	101	NA	NA	NA	NA	NA
Georgia Institute of Technology-Main Campus	RU/VH	453*	494,019*	226	87%	0.47*	517*	341*	0.69	239*	65	2411
Michigan Technological University	RU/H	43	57,606	29	105%	0.11	147	35	0.61	15	10	462
Montana State University	RU/VH	26	117,321	126	111%	0.05	226	26	0.22	17	49	289
<b>NJIT</b>	RU/H	<b>59</b>	<b>89,169</b>	<b>23</b>	<b>118%</b>	<b>0.15</b>	<b>220</b>	<b>84</b>	<b>0.94</b>	<b>77</b>	<b>117*</b>	<b>448</b>
Texas Tech University***	RU/H	57	51,879	97	12%	0.05	45	42	0.81	16	7	107**
University of Alabama in Huntsville	RU/VH	32	61,508	78	53%	0.10	197	21	0.34	7	3	1012
University of Alaska Fairbanks	RU/H	22	101,451	0	14%	0.04	180	NA	NA	NA	NA	NA
University of Louisiana at Lafayette	RU/H	20	53,413	15	74%	0.03	88	NA	NA	NA	NA	NA
University of Maryland-Baltimore County***	RU/H	64	58,880**	63	169%	0.09	80	30**	0.51	30	7	88
University of Massachusetts-Lowell	RU/H	29	34,125	0	76%	0.07	85	NA	NA	NA	NA	NA
University of Vermont	RU/H	32	113,658	90	77%**	0.03	106**	23	0.20	10	3	171
Virginia Polytechnic Institute & State University	RU/VH	234	359,268	312	112%	0.11	172	176	0.49	86	23	2023
Drexel University	RU/H	76	98,600	102	340%*	0.06	76	128	1.30	78	19	179
Illinois Institute of Technology	RU/H	54	22,043	143	64%	0.14	57	NA	NA	NA	NA	NA
Lehigh University***	RU/H	59	36,615	69	31%	0.13	79	18	0.49	11**	NA	NA
Rensselaer Polytechnic Institute	RU/VH	118	75,111	96	92%	0.30	188	67	0.89	33	10	723
Stevens Institute of Technology	RU/H	41	25,734	17	87%	0.17	107	40	1.55*	20	3	0
Wake Forest University	RU/H	60	199,467	136	141%	0.04	134**	82	0.41**	NA	8	95636*

\* Category Maximum, \*\* Category Median, \*\*\* No 2009 AUTM Data reported, AUTM 2005 data substituted

**ENRICHMENT OF THE QUALITY OF LIFE OF THE UNIVERSITY COMMUNITY:** In 2002, the campus was a typical urban landscape lacking distinction. Since then there has been a most profound change in its appearance. A concerted effort in campus beautification combined with the launching of a new university branding initiative has made a significant change in the look of the campus. As a result of the 2005 *Landscape Master Plan*, NJIT's Newark campus has

blossomed into an attractive, pleasant environment for students and staff within the landscape of University Heights. The beautification efforts combined with signage and banners reinforce university branding to establish a distinct campus presence within Newark. NJIT is more involved than ever in its immediate community and promoting its potential as a vibrant cultural center. Enhancing campus life and the neighborhood around NJIT is important to the growth of NJIT as an urban university.

A key priority of the 2004 Strategic Plan was to improve the quality of campus life, focusing on campus appearance, administrative infrastructure, athletics, and cultural activities. The reconfiguration and enhanced landscaping of the Campus Green, the installation of the artificial turf soccer field and running track, and the now completed move to NCAA Division I Athletics are all acknowledged as contributing to a more attractive and engaging campus atmosphere. The acquisition of Central High School, the addition of the Naimoli Center, and the plans for the Greek Village will increase classroom and living space for the entire campus community.

As a key element of NJIT's engagement in regional economic development, NJIT is making a major contribution to the Newark Renaissance. The *Campus Gateway Project* is a key effort to improve amenities available to the university and revitalize the surrounding community. The project elements include enhanced housing and new commercial space with shops and restaurants. When completed, the project will result in the establishment of a Greek Village for fraternities and sororities—as well a residential Albert Dorman Honors College on campus property adjacent to Raymond Boulevard and Warren Street—with an existing row of fraternity houses along Martin Luther King Boulevard converted into professional offices and / or residences. The Newark Municipal Council has passed a resolution designating NJIT as the “sole and exclusive redeveloper” of properties specified in the Gateway Plan, covering an area of 18 acres north of campus. Such leadership in community redevelopment is unique among public universities nationally. To assure mission penetration through the Campus Gateway Project, a new post—Director of Area Development and President of Campus Gateway Development, Inc.—was created in the fall of 2011. From 2002 to 2011, the evolution and impact of NJIT's mission, vision, core values, value proposition, and goals are clearly demonstrable.

**ENTERPRISE RESOURCE PLANNING:** NJIT has a mission that is distinct from other universities in the region and the state. Part of this uniqueness is an approach that uses technology to solve complex social problems. In keeping with the strategic priority—to enhance and enrich the quality of life of the university community and ensure a focus on the student—NJIT initiated a project to reengineer systematically its administrative and academic processes; begun in June 2008 this multi-year, campus-wide effort would improve customer and student satisfaction. Hence the efforts to implement new ERP (Enterprise Resource Planning) systems at NJIT have been branded as *Project ORBIT* (Organizational Reengineering using Banner Information Technology).

*Project ORBIT* has now been successfully implemented to provide a single integrated database for the university's core student, financial, and human resource operations. The integrated database has eliminated a silo approach in many cross-functional university processes. Students, faculty, and staff have easy access to information through web browsers. New reporting features provide improved access to information that academic administrators require for efficient management.

FY2011 witnessed completion of the major phases of *Project ORBIT*, a three-year effort to upgrade the university's legacy student, financial, and human resource information systems with a modern suite of software. *Project ORBIT* will better position the university to deliver increased

services to students and faculty, automate complex business processes, and support data-driven decision making for long-term strategic planning. Information technology remains an intrinsic part of the campus culture, a vital part of the university's infrastructure. The FY2012 budget includes a financing program to provide approximately \$9.6M with most of these funds earmarked for technology and technology infrastructure upgrades.

**FACTORS IMPACTING THE NJIT MISSION:** Internal and external forces determine the state and future trajectory of the university. The major external forces are the level of state funding, the rapidly changing professional landscape, new student demographics, and emerging political currents. In turn, the main internal forces are evolving research funding priorities and enrollment challenges and opportunities. Additionally, NJIT uses a collective bargaining process that typically follows state trends; however, in recent years, the associated costs have not been funded by increases to our state appropriation.

University revenues experienced a qualitative shift in 2000-2001, when state budget appropriations became a smaller fraction of the total university budget, and tuition revenues became the dominant source. Including other revenue sources, such as research funds, the total budget has steadily increased over the past 10 years. An increasingly more competitive recruitment environment has thrown into question an approach that relies on continuous population growth. Relative to graduate students in particular, national immigration policies are changing and a stronger reliance on US nationals may be important. Critically examining the nature and effectiveness of new teaching approaches, such as distance education, is necessary. All professions—particularly engineering, architecture, and the basic sciences—have significantly changed in recent years, and are expected to change even further in the future. This disciplinary shift imposes a requirement to implement changes in curriculum and in staff preparedness and training.

As the *Report of the Governor's Task Force on Higher Education* (December, 2010) and draft *State Strategic Plan: New Jersey's State Development & Redevelopment Plan* (October 2011) emphasize, New Jersey state universities must be increasingly able to compete for out-of-state students while retaining in-state students. World-class colleges and universities must not only educate; they must also have the potential to invest in research and development with private sector partners.

Research funding has been successful and is reflected in the rapid growth of external funds from federal, state, private sources, and congressionally directed appropriations. As these appropriations become more uncertain in the future, dependence on the other sources of funding mentioned will increase. At NJIT, Sponsored Research Administration (SRA), as part of the Office of Research and Development, advises and assists faculty and staff members of the NJIT community in all aspects of externally funded research projects and other scholarly activities—from the identification of a potential sponsor and the preparation of a proposal, through various administrative functions (related to budgets, personnel, sub-contracts, reporting and accountability, and negotiations with the sponsor) during the course of the project, to the submission of the documents required to close out the project.

Because tuition and fees now constitute the largest fraction of university revenue, enrollment at all levels is a major internal force to drive change. Total enrollment in the fall of 2002 was 8,862. In the fall of 2011, enrollment increased to 9,556. The 7.8% increase in enrollment has been accompanied by investments that adequately address the instructional and support services needs of these undergraduate and graduate students. In terms of the faculty and instructional staff needed to maintain the fall 2011 student-faculty and instructional staff ratio of 16:1, the



*Building for the Future* initiative analyzed in Chapter 10 addresses the university's commitment to recruitment and retention of high caliber individuals committed to thematically-based research, instruction, economic development, and service.

**CONCLUSIONS:** Working Group 1 was charged to determine compliance with MSCHE Standard 1: Mission and Goals. The Working Group found that NJIT achieved exemplary performance in clearly defining its mission and goals and in analyzing mission and goals related to external as well as internal contexts and constituencies.

The Working Group found that NJIT had achieved emerging excellence in unifying institutional goals that are consistent with the mission and had identified and met goals that focus on institutional assessment and assessment of student learning.

**STRATEGIES FOR THE FUTURE:** After extensive deliberation on the university's commitment to its mission and goals, NJIT has identified the following areas of improvement. These two areas will be integrated into the strategic planning process:

1. NJIT will continue to focus on cohesive integration of academic unit planning with the overall strategic goals at the institutional level;
2. NJIT will enhance mission penetration of strategic planning initiatives through increased communication that leverages digital, web-based environments to which outcomes are reported and posted for shareholder review.

## CHAPTER 2. NJIT PLANNING, RESOURCE ALLOCATION, AND INSTITUTIONAL RENEWAL

**STANDARD ADDRESSED:** This chapter addresses Standard 2 of the *Characteristics of Excellence in Higher Education*: Planning, Resource Allocation, and Institutional Renewal.

**EXECUTIVE SUMMARY:** Strategic planning at NJIT is an ongoing process intended to enable the university to reaffirm its core values and execute its mission. Strategic planning allows the university to align its institutional efforts, especially with respect to resource allocation and renewal, around specific objectives. NJIT's commitment to planning, resource allocation, and institutional renewal is substantial; as such, the university's methods for determining resource allocation are well-articulated, attending to synergies that exist between resource allocation and planning. The university community also attends to the relationships and channels of communication between planning at the institutional level and planning at the level of the academic units, especially in terms of stated institutional and academic unit goals.

**INTRODUCTION:** Adhering to the institutional assessment framework defined in the *Characteristics of Excellence in Higher Education*, NJIT conducts its ongoing planning and resource allocation based upon clearly articulated mission and goals, developing objectives to achieve the university's goals and utilizing the results of its assessment for planning and institutional renewal. At NJIT, implementation and subsequent evaluation of the success of strategic planning initiatives and resource allocation processes are sufficiently flexible to ensure improvement and maintenance of institutional quality.

NJIT actively engages in a well-planned process of growth, development, and change. Strategic planning at NJIT is rooted in a framework that fosters shareholder participation, insures transparency, places emphasis on measurable outcomes, and enables assessment to occur for the purpose of institutional renewal. These planning principles, exercised under the direction of the president and approved by the Board of Trustees, formed the basis for the strategic planning initiatives of 2004-2010 and 2010-2015. Prior to 2002, NJIT had in place a budget resource development and allocation process with a strong emphasis on strategic planning that required clear resource identification and assessment of the operational results. During that period, the planning process was conducted on an on-going basis aligned to the state's fiscal cycle. The decision to revise strategic planning practices from those in place during the 2002 Middle States Self-Study was based on the need to refine and focus strategic planning with measurable goals and specified resource allocation.

A key component of NJIT's current strategic planning process is *ViSTa, A Strategic Planning Process for NJIT: Vision-Strategy-Tactics*, a system for strategic planning that was adapted to the distinct challenges NJIT faces as an institution. The implementation of the *ViSTa* framework clarified and concretized the planning process so that it is possible to identify how each priority and objective in the final strategic plan can be clearly correlated to each step in the planning process. (An analysis of *ViSTa* is provided in Chapter 7.)

**RESOURCE ALLOCATION AND ASSESSMENT:** The strategic planning process defines resource allocation in a continuous dynamic process that leads to periodic assessment and systematic change. Resource allocation aligns with near-term strategic objectives and long-term goals. Major resource requirements are detailed annually in the state budget submission document.

Major resource allocation is managed centrally, and critical decisions are made at the senior staff level.

As noted in Chapter 1, the *Strategic Plan, 2004-2010* identified strategic priorities to establish NJIT as a student-centered environment for intellectual growth. To support the plan, an initial \$1.1M was reallocated to create a “Reinvestment Fund” in FY04. By the conclusion of FY10, cumulative expenditures related to five core objectives exceeded \$33.3M. Private and public funds were also raised to support these core objectives.

The first objective, “Enhance and Enrich the Quality of Life,” included elevating athletics to NCAA Division I status; improving web services, calendar functions, and announcements; developing and implementing a comprehensive facilities master plan, campus building and landscaping appearance improvements; and reengineering the employment process. Over this period, cumulative investments in this objective totaled approximately \$17.9M. The second objective was to “Become Nationally Recognized for Attracting High Achieving Students.” Cumulative expenses approaching \$2.9M included the following: additional student awards for urban scholars, National Merit Scholars and Fulbright Scholars; expansion of college recruitment (and outreach) efforts; additional summer and winter session support to improve academic standing, retention, and graduation rates. The third objective was to “Develop a Core of Nationally Recognized Programs.” Over this period, approximately \$8.7M was committed primarily in three core academic departments: The Department of Mathematical Sciences, the Department of Electrical and Computer Engineering, and the College of Architecture and Design. The fourth objective was to “Increase Revenue from Private Sources.” Additional staff, programs, and feasibility studies were completed to support the various fundraising campaigns (e.g., in the Albert Dorman Honors College, athletics, and the comprehensive campaign). Approximately \$2.8M was committed to these efforts. The fifth objective was to “Improve National Ranking in Research and Development,” with most of the approximately \$1M expended to support the Office of Research and Development and Office of Technology Development.

A Milestone Strategic Plan Progress Assessment Report tracked success quantitatively and qualitatively of strategic priorities by task force and activity. These reports were organized according to priorities and objectives and indicated the percentage of the target achieved in each area.

By conclusion of the *Strategic Plan, 2004-2010*, research expenditures reached \$92M, as Table 2.0 illustrates. NJIT’s achievements advanced basic research and applied these advances to address problems at both national and state levels. The largest growth occurred in the area of federal research expenditures. Growth in research and development over the last five years include the following key areas: defense, homeland security, solar physics, and transportation. Some of these achievements include the following: establishment of the Advanced Clustered Energetics (ACE) program and the Disruptive Technologies Program, anticipated to develop specific applications for weapons designed to defeat deeply buried or wall-protected targets; the construction of the world’s largest ground-based solar optical telescope at Big Bear Solar Observatory; and selection of NJIT by the NJ Office of Homeland Security and Preparedness to lead an effort to catalogue port-related interdependencies and develop an assessment leading to the new programmatic funding to achieve resiliency of the civil infrastructure in NY-NJ metropolitan area.

Table 2.0. Research and Associated Expenditures by Source. [Data include two years prior to and one year after the strategic plan time period of 2004-2010. Figures listed in millions of dollars.]

Year	Federal	State	Other	F&A	External Total	Internal Total	Grand Total
01-02	22.0	8.9	11.7	4.2	46.8	22.3	69.1
02-03	24.9	11.0	11.4	5.1	52.4	21.3	73.7
03-04	24.8	7.3	11.0	5.4	48.5	26.5	75.0
04-05	28.4	4.3	11.3	6.0	50.0	26.9	76.9
05-06	28.1	5.3	12.0	6.5	51.9	25.7	77.6
06-07	34.7	5.0	12.6	7.1	59.4	29.3	88.7
07-08	33.2	4.7	13.4	7.4	58.7	30.9	89.6
08-09	35.4	4.8	13.5	7.8	61.5	31.4	92.9
09-10	34.9	4.7	14.0	7.3	60.9	31.4	92.3
10-11	42.0	4.9	13.1	8.2	68.2	32.3	100.5

The Office of Research and Development substantially benefitted from the 2002 MSCHE periodic review and its recommendation to increase funding and staffing. Since 2007 unrestricted expenditures within the Research and Development Division have more than doubled to support research efforts. In order to strengthen the NJIT service mission under the Office of Research and Development, knowledge developed by faculty and students becomes an invaluable asset guiding state and municipal leaders in policy formation and improved operation of government services and civil infrastructure.

**INSTITUTIONAL RENEWAL AND PLANNING FOR CHANGE:** NJIT uses the results of strategic planning very effectively to initiate institutional renewal. NJIT utilizes comprehensive reporting and strategic plan progress assessment to recalibrate and refine the university's vision, strategies, and tactics. While external economic realities constrained the development of some funded initiatives, the strategic plan is still producing outcomes in key areas. (Chapter 3 presents an analysis of the current economic situation facing the university.) NJIT views these external factors as challenges to be met; as such, the present strategic plan calls for developed income streams to enhance educational initiatives and increase enrollment. A faculty separation program to reinvest in emerging areas integral to the NJIT mission is in place, as is articulation of a new comprehensive campaign to provide student financial support and further strengthen the university community. (The Faculty Separation Incentive Program and the *Building for the Future* initiative are both analyzed Chapter 10.)

NJIT is increasingly dependent on student enrollment as a revenue source for human, financial, technological, and facility resources. NJIT has developed an enrollment plan that includes activities to consolidate and streamline recruitment and enrollment procedures as well as enhance visibility of the 22 new degree programs developed under the *Strategic Plan, 2004-2010*. The university strategic plan presently calls for an enrollment increase to 11,000 students, with an increasing percentage of graduate students. (Chapter 8 presents an analysis of the enrollment plan.) Emerging tactics used to achieve increased graduate enrollment include the following: expanding the use of the new Banner customer relationship management system for enhanced coordination of recruitment, admissions, and enrollment; a newly formed affiliation with IDP Education, a student placement firm, to generate more applicants from overseas; international recruitment trips to India, China, and Canada; developing the Overseas Partner

Initiatives to create graduate student education partnerships with universities in China and India; expanding the number of Master's Fellowship awards; and increasing the number of prospective student names purchased through the GRE service. (An analysis of the approved substantive changes associated with graduate degree programs in China and India is presented in Chapter 8.)

In an environment of declining state support, corporate giving—the largest donor group from 2002 to 2011—becomes increasingly important. Private foundation support has nevertheless decreased during this time, as well as giving by friends. Alumni support is the second largest donor group, and the number and total level of giving increased then remained consistent during the 2004-2010 strategic plan. To face the challenge of declining state support, NJIT is undertaking a major comprehensive campaign with the goal of raising at least \$150M over the period of 2007 to 2017. The goals of the campaign include increased student financial support, funding for recruitment and retention of outstanding faculty, and the design of a next-generation campus, one that uses advanced wireless systems to connect information and people both on and off campus.

The university has a well-defined and transparent process for strategic planning and resource allocation to establish and achieve strategic priorities. The processes for operational planning and resource allocation to meet on-going operational priorities and capital maintenance needs for human, financial, technological, and facility resources are centralized at the senior staff level. These needs must be met from a small portion of the annual operating budget. Constrained budgets have deferred capital maintenance in a number of areas, including classrooms, laboratories, library collections, building, and technology infrastructure. The loss of state programs for capital improvement and maintenance projects in facilities, equipment, and technology infrastructure have added additional burdens to operational budgets. In spite of these challenges, the university has shown agility in meeting emerging operational necessities.

**CONCLUSIONS:** Working Group 2 was charged to determine compliance with MSCHE Standard 2: Planning, Resource Allocation, and Institutional Renewal. The Working Group found that NJIT had achieved emerging excellence in the following areas: planning and improvement processes that are clearly communicated, provide for constituent participation, and incorporate the use of assessment results; well defined decision-making processes and authority that facilitates planning and renewal; the assignment of responsibility for improvements and assurance of accountability; and periodic assessment of the effectiveness of resource allocation and institutional renewal.

The Working Group found that NJIT met the standard for possessing a clearly articulated mission that had achieved integration throughout the university, and that the integration was informed by mission-related assessment results. The Working Group also found that the university had an established, well documented record of institutional and academic unit improvement.

**STRATEGIES FOR THE FUTURE:** After extensive deliberation on the university's commitment to planning, resource allocation, and institutional renewal, NJIT has identified the following area of improvement. This area will be integrated into the strategic planning process:

1. NJIT will strengthen multidisciplinary, thematic relationships among institutional, operational, and unit-level management to ensure these are effectively aligned with the *Strategic Plan, 2010-2015*.



### CHAPTER 3. NJIT INSTITUTIONAL RESOURCES

**STANDARD ADDRESSED:** This chapter addresses Standard 3 of the *Characteristics of Excellence in Higher Education*: Institutional Resources.

**EXECUTIVE SUMMARY:** NJIT has the human, financial, technical, and physical facilities necessary to achieve its mission; these resources are available and accessible. In the context of NJIT's mission, effective and efficient use of the university's resources has been integral to ongoing outcomes assessment. In a national and international environment of financial uncertainty, NJIT's institutional resources—coordinated by Henry Mauermeyer, Senior Vice President for Administration and Treasurer—have been efficiently managed by a notably effective team.

**INTRODUCTION:** Adhering to the institutional framework defined in the *Characteristics of Excellence in Higher Education*, NJIT has, despite on-going financial challenges, prudently managed human, financial, technical resources and physical facilities necessary to support the university's mission. Effective and efficient use of the university's resources is analyzed according to a defined budget workflow process that is integral to the university culture of ongoing outcomes assessment.

The detailed NJIT operating budget is conservatively developed and considers many internal and external factors. These factors include enrollment expectations, residence hall occupancy, tuition/fee rates, financial aid needs, labor agreements, state funding, non-personnel inflation, strategic initiatives, federal, state, and other grant funding, unrestricted giving, and investments. Early recognition of factors impacting the budget permits senior administration to develop revenue and expense alternatives. Annual budget requests are displayed on budget development scorecards for ongoing discussion by senior administration. Initially, budget requests exceed available resources, so the review process is continual until a balanced budget is achieved. In late spring there is an initial review by the Audit and Finance Committee of the Board of Trustees. Ultimately, proposed operating and capital budgets are submitted to the Board of Trustees for approval at their July board meeting. Afterwards, the budgets are continually monitored for any internal or external conditions that may impact the overall budget. Any potential issues are identified and resolved in consultation with senior administration. The Board of Trustees continues to receive periodic budget updates at its regularly scheduled meetings.

Capital projects recently completed, or currently planned, include the restoration of recently purchased Central High School, the Naimoli Family Athletic and Recreational Facility, the Greek Village and Residential Dorman Honors College, which represents the initial phase of the NJIT Campus Gateway project.

**RESOURCE DEVELOPMENT AND ALLOCATION PROCESS:** NJIT follows a budget resource development and allocation process that facilitates clear funding identification and assessment of operational results. This process is conducted on an on-going basis and is closely linked to strategic planning.

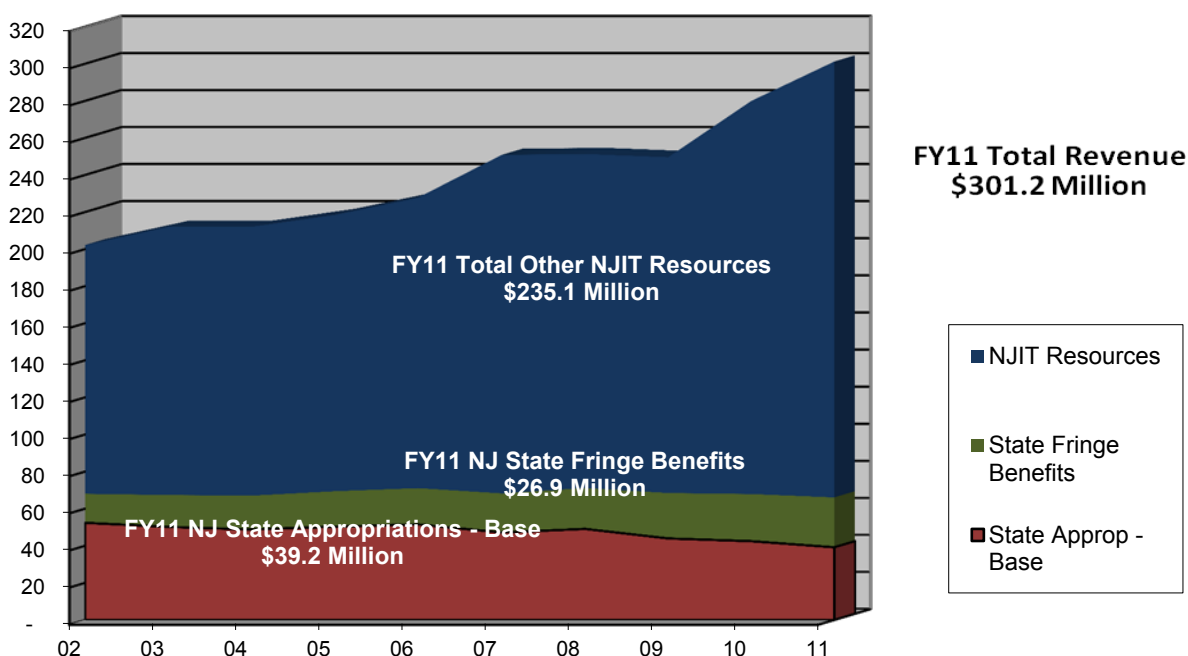
The budget workflow process, with its focus on strategic planning and emphasis on iterative review by a variety of shareholders, has proven enormously effective. The NJIT resource allocation process, with approval from the Board of Trustees, has achieved the following aims: to assess and determine how best to develop and allocate resources that support accomplishing the university's strategic objectives; to conduct a campus-wide budget briefing in early July to inform the community of major operating budget considerations prior to official Board of Trustee

review and action; to determine the financial, human and facility requirements to achieve the operational effect; to conduct operations on an annual basis within available resources; to assess outcomes of operational programs, processes and financial results on an on-going basis; and to communicate results to the university community and constituency.

The dramatic decline in the world economy during 2008-2009 did, however, adversely impact the University's endowment. Endowment investments totaled \$57.7M at June 30, 2009 reflecting a loss of \$14.5M (20.2%). However, over the past two years, the endowment has increased by 30.9% (\$17.8M) and totals \$75.6M at June 30, 2011, reflecting realized investment gains, fair value increases, and new gifts. As the June 30, 2010, Financial Statements' Management's Discussion and Analysis noted, "The University's endowment is prudently managed, with a broad-based asset allocation. A group of managers, each focused on their sector of the asset allocation, limited exposure to sub-prime investments, and use of alternative investments, including timber, to implement the investment strategy have, to date, been reasonably effective given the overall market conditions."

**A TEN YEAR FINANCIAL HISTORY OF NJIT:** Over the past ten years, total operating resources, (per annual financial statements) have increased to \$301.2M for FY2011, a growth of \$99.0M, or 49% from FY2002. Over this ten year period, as Figure 3.0 shows, base state appropriation support has declined by \$13.2M (-25%) while state support for employee fringe benefits has increased by \$11.2M (72%) resulting in a \$1.9M (-3%) overall reduction in state funds. Total state support currently represents approximately 22% of total operating resources, compared to 34% a decade earlier.

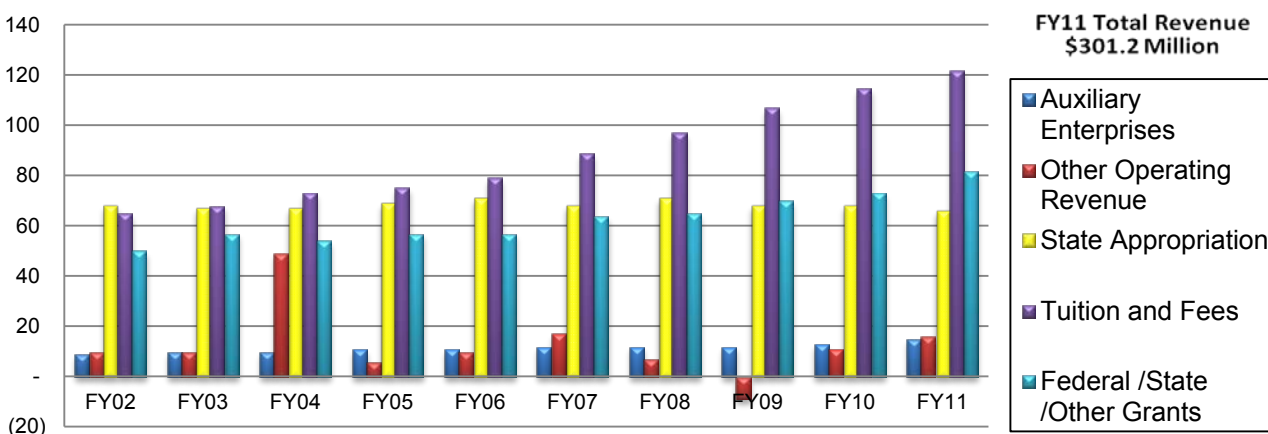
Figure 3.0. NJIT Financial History, 2002 to 2011 [Operating Resources in Millions]



Over this same period, tuition and fee revenue has increased by \$57M (88%). This increase is due to a combination of enrollment growth and rate increases. As Figure 3.1 shows, tuition and fees represent approximately 40% of total FY11 revenue sources, compared to 32% ten years earlier. FY11 total revenue is \$301.2M. Substantial growth (\$32M, or 64%) in federal, state and other grants occurred over these past ten years. This growth was attributable to the *Strategic*

*Plan, 2004-2010* objective of increasing external sources of revenue. Auxiliary enterprises (residence halls, bookstore, food services and parking) revenue has increased by \$6M (67%), primarily due to the increase in on-campus housing from 1146 to 1663 beds. This initiative was a FY04–FY10 strategic plan objective. An additional 600 beds are planned as part of the Gateway initiative. Over this ten year period, growth in federal, state, and other grants total \$15.9M, or 42%. This growth is consistent with the strategic objective of increasing external grants and contracts.

Figure 3.1. NJIT Revenue Sources, 2002 to 2011 [Revenue Sources in Millions]



The majority of expenditures at NJIT continue to be academic and research related, supporting the primary mission of the university. Academic and research expenses have increased from \$125M in FY2002 to more than \$160M in FY2011, a growth of 28%. To support strategic objectives related to Athletics, the Albert Dorman Honors College and other high achieving or need-based students, scholarship and fellowship expenses have increased by 120% since FY2002, from \$20M in FY2002 to \$44M in FY2011. Over the same period, support expenses (facilities, administration, and fund raising) have increased by \$7M (18%).

As part of on-going fiscal planning, the University Budget Office prepares multiple year budget models. These models start with base data and project unrestricted operating budget as well as Statement of Revenues, Expenses, and Changes in Net Assets incorporating historical trends and future estimates. These models consider numerous planning assumptions, including salary program, enrollment, research, inflation, state funding, fringe benefit rates, fundraising, and strategic plan objectives. The models can be quickly modified to analyze the resulting budget impact. Revenue and expense assumptions are conservative, but realistic, especially given the current economic climate.

**FACILITIES AND MAINTENANCE:** Capital project funds to support facility repairs, maintenance, technology, and minor facility improvements are initially identified and funded from the base operating budget. Every year a list of capital projects is presented to senior staff to review and to prioritize. The most immediate needs are addressed first. These types of projects encompass, for instance, roof replacements, HVAC maintenance, updated computer labs and servers, classroom fixtures and furniture, and elevator maintenance. This list of funded capital projects is also included in the annual budget presentation to the Board of Trustees.

On the NJIT campus, major facility construction/renovation projects have been funded from multiple sources including: State bonds, NJIT bonds, private gifts, and operating reserve funds. Most recently, as part of a bond refinancing, an additional \$20M was borrowed to purchase and

begin renovating Central High School. At that time, Moody's Investors Service, Inc. and Standard & Poor's Rating Services affirmed their municipal bond ratings of "A1" and "A+," respectively.

Progress on campus development has been on-going at NJIT, and follows the Facilities Master Plan updated in 2008. The NJIT campus encompasses more than 45 acres with 30 buildings containing approximately 2.9 million gross square feet with a current replacement value of \$906M. Of the total building space, approximately 80% was constructed after 1965. The past ten years witnessed renovation of the Campus Center, Fenster Hall, and Eberhardt Hall.

Outside of New Jersey, management of the Big Bear Solar Observatory in Big Bear Lake, California, and a dedicated array of solar radio telescopes at Owens Valley Radio Observatory in Owens Valley, California, became the responsibility of the Center for Solar-Terrestrial Research at New Jersey Institute of Technology effective July 1, 1997 under a lease for the land and buildings until the year 2048. With significant upgrades in equipment, instrumentation, and a new telescope, the observatories and equipment are now valued at approximately \$12M.

NJIT recognizes the importance of facility environmental performance over its life cycle in order to conserve energy and protect the environment. To achieve this mission NJIT employs many types of efficiency strategies to foster a green campus environment. One way to meet this goal is through on-site power generation, which was made possible by rebate funding from the NJ Board of Public Utilities. NJIT strategic planning also calls for the improvement of the exterior of facilities to conserve energy by optimizing building shading, insulating exterior walls and roofs, and limiting glazing area to 25% window-wall ratio wherever possible. In 2010 the university received \$1.7M in Federal American Recovery and Reinvestment Act funds for green initiatives to be put in place for Oak Residence Hall. As part of this initiative, NJIT utilized solar technologies to replace gas as the primary source of hot water for cooking, showering, and laundry. To improve electricity efficiencies, regenerative elevator technology that captures energy generated when an elevator descends or rises was employed, and electronic ballasts were put in place to improve lighting efficiencies for common areas with the most advanced fluorescent technology.

**THE ROBERT W. VAN HOUTEN LIBRARY:** In Middle States reviews of both 2002 and 2007, resource allocation to the Van Houten Library presented the same challenge in institutional resource allocation faced by post-secondary institutions across the country. However, the total library budget increased by \$1M and now represents 2.1% of the general operating budget (which excludes student awards and mandatory transfers) compared to 1.9% 10 years earlier. Salary increases of 52% (\$0.7M) and non-personnel increases of 26.7% (\$0.3M) occurred over this period. It is important to emphasize this gain in light of the 2007 periodic review report's recommendation that the library staff draw up a plan for adding 5,000-7,000 new book titles annually to the over 170,000 books presently in the library and present that plan to the faculty and administration for their consideration and possible implementation. While that list was established, the critical maintenance and growth of databases for a research university—coupled with enhanced efforts to increase inter-library loan efficiency, collaborative efforts with Dana Library at Rutgers-Newark, and increased attention to eBook purchases—addressed the need for more books. (An analysis of the Robert W. Van Houten Library is provided in Chapter 11.)

Establishing a browsing library of books did not align with the NJIT research mission. Keeping pace with the rising costs of digital databases seemed a more appropriate use of resources. Full text databases remain the main focus of library purchases. Access to scientific, engineering and other journals continues to be a key resource that the library provides to the NJIT academic

community. The Van Houten Library continues to meet the informational needs of its shareholders.

Present plans to increase library funding include the Knowledge Services Center initiative. Funding would come from a proposed general obligation bond issue anticipated to appear on the November 2012 General Election ballot seeking the approval of New Jersey residents. The construction, if funded, will provide a new learning environment including provisions for group projects utilizing current technologies. The innovative ways in which learning has evolved require new collaborative spaces, furniture, interactive learning technologies, and the integration of their mobile technologies. The Knowledge Services Center initiative will then become the NJIT campus test-bed for independent and peer-to-peer learning outside of the classroom. This initiative, projected at a cost of \$18M, is one of \$225M that NJIT has proposed to enrich the campus environment.

**INDEPENDENT REVIEW OF INSTITUTIONAL RESOURCES:** An independent auditing firm (currently KPMG LLP) annually audits the university financial statements with results discussed with senior administration and the Audit and Finance Committee of the Board of Trustees. There is an executive session with the auditors and Audit and Finance Committee prior to the report being submitted to the entire Board of Trustees. The firm's unqualified opinion consistently recognizes that the financial position of New Jersey Institute of Technology and the changes in its financial position and its cash flows are in conformity with U.S. generally accepted accounting principles with no material weaknesses indicated (KPMG LLP, NJIT, 2003-2011). To enhance reporting, financial data are provided to the Office of Institutional Research and Planning for inclusion in annual IPEDS and other external reports such as the New Jersey Commission on Higher Education.

**CONCLUSIONS:** Working Group 2 was charged to determine compliance with MSCHE Standard 3: Institutional Resources. The Working Group found that NJIT had achieved exemplary performance in establishing a financial planning and budgeting process aligned with the institution's mission, goals, and plan that provides for an annual budget and multi-year budget projections, both institution-wide and among departments; in utilizing planning and assessment documents; and in addressing resource acquisition and allocation for the university and any subsidiary, affiliated, or contracted educational organizations as well as for institutional systems as appropriate. Exemplary performance was also evidenced in NJIT's annual independent audit confirming financial responsibility.

The Working Group found that the university had achieved emerging excellence in the following areas: strategies to measure and assess the level and efficient utilization of institutional resources required to support the institution's mission and goals; rational and consistent policies and procedures in place to determine allocation of assets; an allocation approach that ensures adequate faculty, staff, and administration to support the institution's mission; a comprehensive infrastructure, facilities master plan, and facilities/infrastructure life-cycle management plan informed by the NJIT mission; facilities that are adequately supported and staffed to accomplish the institution's objectives for student learning; an educational and other equipment acquisition and replacement process and plan, including provision for current and future technology; adequate institutional controls to deal with financial, administrative and auxiliary operations; and periodic assessment of the effective and efficient use of institutional resources.

**STRATEGIES FOR THE FUTURE:** After extensive deliberation on the university's commitment to providing effective and efficient use of institutional resources, NJIT has identified the following areas of improvement. These two areas will be integrated into the strategic planning process:



1. NJIT will improve awareness of processes associated with tracking, monitoring, and reporting budget allocations that impact human resources, technological resources, and facilities;
2. NJIT will improve awareness of processes associated with use and allocation of key research, educational, recreational, and administrative space.

## CHAPTER 4. NJIT LEADERSHIP AND GOVERNANCE

**STANDARD ADDRESSED:** This chapter addresses Standard 4 of the *Characteristics of Excellence in Higher Education*: Leadership and Governance.

**EXECUTIVE SUMMARY:** Systematic development and deployment of checks and balances are critical to success in leading and governing an institution with a large number of constituents. NJIT has defined and put in place processes that govern the roles of its shareholders: advisory boards, administration, faculty and instructional staff, students, and the public. Although NJIT's governance has been adequate in achieving mission fulfillment, the occasion of the decennial self-study for MSCHE has led the institution to seize this opportunity to plan an enhanced model of shared governance to meet future challenges.

**INTRODUCTION:** Adhering to the institutional framework defined in the *Characteristics of Excellence in Higher Education*, NJIT's system of governance precisely defines the roles of institutional constituencies in policy development and decision-making. The governance structure includes an active governing body with sufficient autonomy to assure institutional integrity and to fulfill mission-centered shareholder responsibilities of policy and resource development.

NJIT is committed to integrated leadership and shared governance. The general leadership and governance process is well defined by the New Jersey State Legislature, the governing body that established NJIT in the New Jersey Institute of Technology Act of 1995. There is described the makeup, authority, and responsibilities for governance of the Board of Trustees, nominated by the Governor with the advice and consent of the Senate. The Board of Trustees appoints the president of the university, who then oversees the multitude of academic and administrative units needed to operate the university and achieve mission-fulfillment. The faculty and instructional staff are represented in the shared governance structure primarily through the faculty governing body—the Faculty Council—which oversees the *Faculty Handbook* among its responsibilities. Governance is also supported by the process of collective bargaining, representing the full-time teaching staff, by the Professional Staff Association.

The membership, bylaws, and minutes of meetings are prominently and openly displayed at the website of the Board of Trustees; similarly, the membership and bylaws of the Board of Overseers are available online. Rules for conduct of both the administration and the faculty are codified in the *Faculty Handbook*, recently revised to modernize it and ensure that it reflects current practices, in addition to instituting substantive changes to address current and future challenges.

**ASSURANCE OF CHECKS AND BALANCES:** Comprehensive and articulated strategies are in place at NJIT for checks and balances among its constituents. Academic governance related to faculty issues is mandated primarily to the Faculty Council, an elected representative group of the faculty. The Council utilizes the *Faculty Handbook* as a guide when it deliberates on behalf of the faculty. Searches for academic posts from chairs to the presidency are conducted in concordance with the *Faculty Handbook*.

Evaluations of the academic and non-academic administrators are conducted every three years. Major decisions affecting the faculty and the academic programs must be approved by the faculty as a whole, as described in the Faculty Council bylaws. The agendas of the Faculty Council meetings are made available to the general public, as are the minutes of the Committee on Academic Affairs, a committee comprised of academic administrators led by the provost. Twice a

semester, the Faculty Council convenes a meeting in which the president and provost attend and present updates of activities pertinent to the faculty. At that time, faculty members are able to question the president and provost.

Students at both the undergraduate and graduate levels are represented by the Student Senate and the Graduate Student Association, respectively. Members of both bodies are elected by their peers, are provided with a budget funded from student fees for that purpose, and hold meetings regularly so that constituents can voice any concerns that they feel their elected officials must address with senior administration. Students have a voice with respect to the faculty through feedback meetings with the chairpersons of the respective departments each semester. In addition, students evaluate all instructors in every fall and spring class taught at NJIT. Should grievance issues or charges arise between faculty and students related to classroom demeanor, a university standing committee is available to hear and resolve issues.

Since 1968, when the State of New Jersey first permitted all State supported colleges and universities to be represented by a collective bargaining unit for public employees, the Professional Staff Association was formed at NJIT. The members comprise tenured and tenure-track faculty and lecturers, and members of the professional staff generally below the title of director. The PSA negotiates directly with the administration on matters permitted by state mandate, such as salary and performance-based pay and represents members on grievance issues of promotion and tenure processes.

The president is held accountable by the Board of Trustees, whose members are appointed by the Governor. The Board holds six meetings a year and provides an open session wherein any member of the NJIT community can ask to be put on the agenda and address the Board. NJIT is audited on an annual basis, including financial statements as well as Single Audits for state and federal programs. The audit consists of an accounting of all monies received and spent by NJIT.

**ROLES OF THE GOVERNING BOARDS:** The Board of Trustees is the legal governing body for NJIT, and performs many of NJIT's official duties, ranging from appointing and overseeing the president, to grant promotion and tenure decisions under the advisement of the academic departments, the University Committee on Promotion and Tenure, and the administration. The Board of Trustees has oversight of the University's annual budget, sets tuition rates, approves changes to the *Faculty Handbook*, sets University policy, and ensures compliance with local, State and Federal regulations. The Board of Overseers is the governing body for the Foundation at NJIT, the 501(c) (3) fundraising arm of the university. Integrity for both boards is assured by state oversight. Board of Trustees and Board of Overseers members work in accordance with the defined ethics guidelines.

The NJIT Board of Trustees holds regular meetings and, in accordance with the New Jersey Open Public Meeting Act, the schedule of the meeting dates is published in the *Star Ledger*, the *Herald News* and the *NJIT Vector*. The schedule is also mailed to the Essex County City Clerk. While public participation at Board of Trustees meetings is not required under the New Jersey Open Public Meetings Act, the Board of Trustees provides for public participation with respect to items of university business in accordance with established procedures. The Board of Trustees holds an annual budget meeting for the campus community each spring.

**ROLE OF ADVISORY BOARDS:** At NJIT, Advisory Boards (also called Boards of Visitors) serve in an advisory capacity to provide a much-needed outside perspective on such issues as the curriculum content, tactics for achieving strategic goals, as well as aiding and advising on recruitment and marketing. The six individual colleges and schools—the Albert Dorman Honors

College, the College of Architecture and Design, the College of Computing Sciences, the College of Science and Liberal Arts, Newark College of Engineering, and the School of Management—have their own boards, which function in ways tailored to the needs of each college and school. There is also a separate board for the Alumni Association. The use of advisory boards extends to the department and research center level, and NJIT makes extensive use of this outside advice to ensure that programs are aligned with the needs of industry, government, and society. These advisory boards meet at different times during the year as needed; in addition all boards are gathered on campus on a single day in April of every year, coinciding with the annual Provost's Research Showcase and department-based research and academic program demonstrations, to provide a broad view of NJIT's many offerings. The Advisory Boards play a role as boosters and in fundraising, and their efforts are aligned with the strategic plan's emphasis on enhancing its base of private support.

**THE LEADERSHIP CONTINUUM AT NJIT:** NJIT prepares its graduates for positions of leadership as professionals and as citizens. The Honors College Leadership Colloquia allow students to interact with leaders in science, business, and government. The Honors Leadership Colloquium Series focuses on the interface between Science, Technology and Society. The program features talks by, and conversations with, industry, academic, and government leaders on a wide range of topics. Multidisciplinary in design, the colloquia incorporate a common NJIT practice—to build the university's leadership position in interdisciplinary programs through student exposure to diverse perspectives—found in programs within each of the colleges and schools on both the undergraduate and graduate levels. On the undergraduate level, for example, the BA/BS in Communication and Media in the College of Science and Liberal Arts includes a Media Arts Track drawing from architecture and information technology. In Newark College of Engineering, master's degree programs such as Bioelectronics, Critical Infrastructure Systems, and Pharmaceutical Bioprocessing are other examples of multidisciplinary degrees designed to enhance leadership. Such continuous effort in diversifying the programs has contributed to naming NJIT among the country's best institutions for undergraduate education, according to *The Princeton Review*.

NJIT also stimulates and recognizes leadership by offering awards at multiple levels within the organization. The presidential leadership award recognizes outstanding student leaders, campus organizations, and programs. The Board of Overseers offers two prestigious awards: a service award presented in recognition of a sustained record of contributions that has enhanced the reputation of NJIT; and an excellence in research medal that recognizes a sustained record of research contributions that has enhanced the reputation of NJIT. The university also has a number of processes in place to identify individuals who have demonstrated excellence in teaching, scholarship and service.

The promotion and tenure process identifies, through those who are tenured and promoted, individuals who may be expected to provide future leadership roles at the university. (An analysis of the promotion and tenure process is provided in Chapter 10.) Faculty members who receive a prestigious NSF Career Award are recognized and nurtured as potential future leaders in scholarship. Faculty, instructional staff, and administrators compete for performance-based awards. These awards result in performance reviews that reward leadership and spur employees to greater leadership roles. (An analysis of the Faculty Performance Based Salary Increase Distribution System is provided in Chapter 6.) As described in Chapter 10, early career faculty members at NJIT are mentored by more senior faculty members. The Department of Electrical and Computer Engineering and the Department of Mathematical Sciences have model programs of leadership.

In 2006, NSF awarded NJIT a three year ADVANCE grant aimed at advancing women faculty by facilitating collaborative research networks. The intent of the grant is to integrate women more fully into the NJIT research environment, thus improving their potential for developing leadership roles at the University. The importance that NJIT places on gender and ethnic diversity can be seen in the 2004-2010 and 2010-2015 strategic plans, both of which place diversity among the university's core values. Proactive strategies are in place to ensure that women and minorities gain the support they need to become effective leaders. Two of the provost's initiatives reflect these strategies: the Open Partnership, linking women to leaders in industry and government; and Work/Life Balance, providing benefits, policies, and resources to enable everyone on campus to negotiate successfully the competing demands of family and work. The Murray Center for Women has played a significant leading role in promoting leadership opportunities on campus through its ADVANCE program. (An analysis of ADVANCE is provided in Chapter 10.)

**THE SHARED GOVERNANCE INITIATIVE:** On March 16, 2011, the Rapid Assessment and Steering Committee (RASC) for the decennial review presented a report to the Committee on Academic Affairs regarding shared governance. In undertaking the self-study, the RASC—adhering to its charge by the president to assess barriers to mission fulfillment and work to resolve them—identified the need for and enhanced model of governance. While the governance model embodied in the Faculty Council, the Undergraduate Curriculum Review Committee, and the Student Senate had served the university admirably, silos nevertheless remained that were judged to be detrimental in a period of rapid change demanding enhanced collaboration among all NJIT shareholders. The RASC believed that an evolved governance model would benefit the university with a clearly defined mission, vision, and authority, by solidifying a deliberative process that assured rigorous analysis, and by creating a cohesive framework for standing committees, with transparent committee processes, that would be responsive to state, regional, and federal environments. Timely closure on key decisions would also result, the RASC proposed, from a new governance system. Leadership by the president, senior administration, Board of Trustees, Faculty Council, Student Senate, and alumni followed. Under direction of the Board of Trustees on April 7, 2011, the president, provost, staff, and alumni formed a committee of key shareholders—faculty and instructional staff, administrators, and students—to design a contemporary governance system for NJIT. The Board has directed that a shared governance model be implemented in the 2011 calendar year. (An analysis of the shared governance initiative is also presented in Chapter 10.)

**CONCLUSIONS:** Working Group 3 was charged to determine compliance with MSCHE Standard 4: Leadership. The Working Group found that NJIT had achieved emerging excellence in the following areas: a well-defined, well-documented system of collegial governance including written policies outlining governance responsibilities of administration and faculty, readily available to the campus community; written governing documents enabling appropriate action; a governing body capable of reflecting constituent and public interest and of an appropriate size to fulfill all its responsibilities; a state-mandated conflict of interest policy for the governing body, covering both ethical and legal conflicts; a process providing continuing updates for current members of the governing body on the institution's mission, organization, and academic programs and objectives; and a procedure in place for the periodic objective assessment of the governing body in meeting stated governing body objectives.

The Working Group confirmed that NJIT had met the standard for an appropriate opportunity for student input regarding decisions that affect them. The Working Group found that NJIT had met the requisite standard for NJIT's governing body; by legislative mandate the governing body was not chaired by the chief executive officer, and the chief executive officer was appointed by the



governing board. The group also confirmed that the NJIT Board of Trustees had certified to the Commission that the institution is in compliance with the eligibility requirements, accreditation standards, and policies of the Commission. The Working Group found that NJIT had met the standard for identification of Governing and Advisory Boards that assist in securing and generating resources needed to sustain and improve the institution. The Working Group found that NJIT had met the standard for periodic assessment of the effectiveness of institutional leadership and governance.

**STRATEGIES FOR THE FUTURE:** After extensive deliberation on the university's commitment to leadership and governance, NJIT has identified the following areas of improvement. These two areas will be integrated into the strategic planning process:

1. NJIT will determine and articulate an evolving shared governance structure that best supports the university's response to current and future challenges;
2. NJIT will re-design its current standing committee system to improve its accountability, coordination, efficiency, decision-making, and reporting.

## CHAPTER 5. NJIT ADMINISTRATION

**STANDARD ADDRESSED:** this chapter addresses Standard 5 of the *Characteristics of Excellence in Higher Education: Administration*.

**EXECUTIVE SUMMARY:** NJIT has, by tradition and intention, been led by an Office of the President which is actively engaged in overseeing the university. NJIT's administrative structures and services are designed to fulfill the university's mission of instruction, research, economic development, and service. Highly articulated information and decision-making systems support the work of administrative leaders, clear documentation is present, and periodic review is conducted. Challenges faced by the university, such as constrained national and state budgets, are anticipated and managed to facilitate mission articulation.

**INTRODUCTION:** Adhering to the institutional assessment framework defined in the *Characteristics of Excellence in Higher Administration*, NJIT hosts an administrative structure and services to facilitate learning and research, foster quality improvement, and support the institution's organization and governance.

NJIT is an administratively-driven university. NJIT's administrative structure promotes the achievement of goals through an engaged Chief Executive Officer. President Altenkirch had successfully anticipated and addressed the challenges of declining budgets, changing demographics, and evolving communities through strategic planning. President Bloom continues in his tradition. Administrative officers are appropriately educated and well trained for their roles, and are largely successful as determined by established metrics and periodic evaluations.

**THE NJIT ADMINISTRATIVE STRUCTURE:** NJIT is led by a Board of Trustees, the legal governing body of the university appointed by the Governor and confirmed by the New Jersey State Senate. Membership of the Board of Trustees consists of the Governor, or his designee, and the Mayor of Newark, both as ex officio nonvoting members—and up to 15 citizens of the State are appointed by the Governor with the advice and consent of the Senate. Standing and Special Committees of the Board include the Executive Committee, the Committee on Building and Grounds, the Committee on Academic Affairs and Research, the Committee on Advancement, the Committee on Audit and Finance, the Committee on Nominations, and the Joint Committee on Investments. NJIT is presently led by nationally-renowned leaders who are deeply engaged in mission fulfillment. With ex-officio members the Honorable Christopher J. Christie, Governor of the State of New Jersey and the Honorable Cory A. Booker, Mayor of the City of Newark, the Board of Trustees is chaired by Kathleen Wielkopolski, formerly EVP and CFO (Ret.) of the Gale Company. Chairman and CEO (Ret.) of Schoor DePalma, Inc., Stephen P. DePalma ('72), serves as Vice Chair of the Board of Trustees; Vincent L. DeCaprio, Ph.D. ('72 and President [Ret.], Vyteris, Inc.) also serves as Vice Chair. Present members include: Anne S. Babineau, Esq. (Wilentz, Goldman & Spitzer); Philip K. Beachem (President, New Jersey Alliance for Action); Dennis M. Bone (President, Verizon New Jersey, Inc.); Peter A. Cistaro ('68 and Vice President [Ret.], Gas Delivery, Public Service Electric and Gas Company); Gary C. Dahms, (Chief Operating Officer/Executive VP, T&M Associates); Elizabeth Garcia ('73 and Manager, Public Affairs, Infineum USA, LP); Anthony J. Knapp Jr. (Proprietor [formerly], Black Horse Restaurant Group); Mariel O'Brien (Astronomy & Physics Educator, Newark Museum); Anthony R. Slimowicz, Esq. (Managing Director, WCD Capital Partners, LLC); and Binay Sugla, Ph.D., (Chairman & CEO, Mobile Matrix, Inc.).

The Board of Overseers provides oversight of the Foundation at NJIT, a 501(c) (3) tax-exempt organization that is the fundraising arm of the university. The Board of Overseers has fiduciary

responsibility for the Foundation, provides a leadership role in fundraising, and allows a critical link between academe and the business community. The Board of Overseers assists NJIT in meeting research and funding goals. The Board is chaired by Philip L. Rinaldi, ('68), Chairman, Phoenix Capital, LLC. Michael A. Wall, Executive Director of Greater Newark Enterprises Corporation, serves as Executive Vice Chair.

The Student Senate and Faculty Council report directly to the Office of the President. (An analysis of the Student Senate is presented in Chapter 9; an analysis of Faculty Council is provided in Chapter 10).

The Office of the President is actively involved in daily coordination of the university, with the following offices reporting directly to him: Provost and Senior Vice President for Academic Affairs; Senior Vice President for Administration and Treasurer; Senior Vice President for Research and Development; Vice President for Academic and Student Services; Vice President of University Advancement; Vice President for Human Resources; General Counsel; and Director of University Audits. The Chief of Staff coordinates the strategies of senior administration. NJIT is fortunate to have been led by Dr. Robert A. Altenkirch, who joined NJIT as the university's seventh president in July 2002 and resigned in November of 2011 to assume the presidency at the University of Alabama at Huntsville. At NJIT, Dr. Altenkirch led both the *Strategic Plan, 2004-2010* and the *Strategic Plan, 2010-2015*. Under his outcomes-focused, accountable, and transparent leadership, he has coordinated efforts to enhance research funding and intellectual property management, to improve the quality of life on campus, to emphasize alumni relations and private fund raising, to gain national prominence for a number of NJIT's academic and research programs, and to strengthen the recruiting of high-achieving students from diverse backgrounds. Dr. Altenkirch served on a number of commissions and boards of the city of Newark and the State of New Jersey, including the Governor's Blue Ribbon Commission on Transportation, Chair of University Heights Science Park, and Chair of the Newark Downtown Core Redevelopment Corporation. In January of 2009, Dr. Altenkirch was recognized by *New Jersey Monthly* magazine as one of the 101 most influential people in New Jersey. Prior to his appointment as President at NJIT, Dr. Altenkirch served as vice president for research at Mississippi State University (MSU) and earlier as dean of the College of Engineering and Architecture at Washington State University. He also served as Dean of the College of Engineering at MSU and as professor and chair of mechanical engineering at the University of Kentucky. Joel S. Bloom, Vice President for Academic and Student Services and Dean of the Albert Dorman Honors College, was appointed President of the university on January 9, 2012.

Academic affairs are coordinated by the provost, Dr. Ian Gatley, who joined NJIT in 2010. The Provost and Senior Vice President for Academic Affairs is the senior academic administrator of NJIT. The six NJIT deans—of the Albert Dorman Honors College, the College of Architecture and Design, the College of Computing Sciences, the College of Science and Liberal Arts, Newark College of Engineering, and the School of Management—report to the provost. The University Librarian, the Associate Provost for Graduate Studies, the Associate Provost for Information Services and Technology, the Associate Provost for Academic Affairs, and the Director of Institutional Research and Planning also report to the provost. Among the many initiatives currently led by Dr. Gatley are the creation of undergraduate learning communities (analyzed in Chapters 8 and 13) and the development of undergraduate retention and graduation initiatives (analyzed in Chapter 8). Holding an appointment as Distinguished Professor in the Department of Physics, Dr. Gatley is internationally known in the fields of astronomy and imaging science. Before assuming a post of academic leadership at NJIT, Dr. Gatley previously ran the Center for Student Innovation at Rochester Institute of Technology (RIT). While at RIT, he took a special

interest in reinforcing the culture of undergraduate research for all students. He previously served as Dean of the College of Science.

Fiscal administration is led by Senior Vice President for Administration and Treasurer Henry Mauermeyer ('72). He is responsible for financial and administrative functions, including the Departments of Finance, Budget, Fiscal Planning, Internal Audit, Physical Plant, Security, Facilities Planning and Construction. Among the region's leaders in fiscal management, Mr. Mauermeyer serves on a number of state and community boards, including the New Jersey Presidents' Council Budget and Finance Committee, the Financial Advisory Committee for the Commission on Higher Education, and the Middle States Association of Colleges and Schools. He serves as vice chair and treasurer of the Board of Directors of Newark Public Radio, as well as vice chair and treasurer of Newark YMWCA. During his thirty-seven year career at NJIT, the university budget has grown from \$15M to \$221M (non-inclusive of research), and the physical plant has expanded from 800,000 square feet to 2.6 million square feet.

Research at NJIT encourages multi-disciplinary centers of excellence that foster partnerships among various disciplines, other educational institutions, private enterprise, and government agencies. The centers and the laboratories report to Dr. Sebastian, Senior Vice President for Research and Development. Research funding at NJIT has grown continuously over the last decade, with research expenditures of more than \$100.5M for 2011. Under an initiative proposed by Dr. Sebastian, NJIT received more than \$23M of the \$2 billion allocated by the American Recovery and Reinvestment Act of 2009. Under the New Jersey Health Information Technology Extension Center initiative, Dr. Sebastian led the New Jersey effort to assist the state's health care providers in their use of health information technology through consultation and user support for at-risk population centers. As Senior Vice President for Research and Development, Dr. Sebastian recently completed a two-year term as Chairman of the R&D Council of New Jersey and is Chairman of the Kessler Medical Rehabilitation Research and Education Center and Executive Board Member of the Henry H. Kessler Foundation. He serves on the Boards of the NJ Marine Science Consortium, NJ Center for Biomaterials, the New Jersey Manufacturing Extension Program, Inc., and the Polymer Processing Institute.

With the appointment of Dr. Bloom as Interim President, Jack Gentul was appointed on October 3, 2011, to serve as Interim Academic Vice President for Academic and Student Services. He is responsible for pre-college programs, enrollment management, continuing professional education, career development services, student services, Educational Opportunity Programs, physical education, the registrar, financial aid and athletics. Distinguished Professor of Electrical and Computer Engineering, Atam Dhawan, who had served as the Associate Dean of the Albert Dorman Honors College, has now become the Interim Dean.

University Advancement reports to the Vice President for Advancement, Dr. Charles Dees. Dr. Dees serves as the chief administrative officer and leader of the advancement program. Under his coordination fall the university's offices of development, strategic communications, alumni relations and special events. To enhance the effectiveness of university strategic communication, NJIT recently underwent a program of rebranding, to standardize its web and media presence. Calls for a comprehensive campaign in *Strategic Plan, 2010-2015*, including an increase in unrestricted gift revenue, are led by this office. Especially suited to his present post, Dr. Dees held posts in the United States Department of Education during the administrations of former Presidents Jimmy Carter and Ronald Reagan. With the White House Domestic Policy Staff, he developed the initial draft of the President's Executive Order for Historically Black Colleges. His board affiliations include Horizon Blue Cross/Blue Shield of New Jersey and the Althea Gibson Foundation.

The Department of Human Resources facilitates the transformation of work life at NJIT. In the university's diverse environment, the human resources play a key role in assuring mission fulfillment. As such, the office takes as its mission the following: to attract, develop and retain a premier and diverse workforce; to anticipate trends and consequently provide strategic solutions; to foster creativity, innovation, and learning; to ensure compliance with all federal, state and local regulations; and to promote fair and equitable treatment for everyone at NJIT. Human Resources is composed of seven divisions: benefits; compensation and classification; the employee assistance program; employment; labor and negotiations; training and development; and ethics. The Department of Human Resources is headed by Vice President for Human Resources Dr. Theodore Johnson. Dr. Johnson has served NJIT in many capacities over the last two decades. Prior to joining NJIT, he served as assistant director for affirmative action at University of Houston-Downtown Campus and as coordinator for affirmative action at the University of Wisconsin campus in Milwaukee, Wisconsin. Dr. Johnson has held significant board appointments during his tenure at NJIT, most recently completing a five-year appointment on the Newark Public Schools Advisory Board. Dr. Johnson is currently a member of the Newark Museum Council and represents NJIT as a member of the Advocates for New Jersey's Children.

The Office of the General Counsel at NJIT is responsible for the university's legal affairs and for the Office of Legal and Employment Affairs. General Counsel and Secretary to the Board of Trustees Holly Stern began her career nearly two decades ago in NJIT's Office of General Counsel and subsequently rose to positions of increasing responsibility. Prior to her serving as interim general counsel, her most recent position was assistant vice president for legal and employment affairs. From 1993 to 1996, Ms. Stern was a member of the Montville Township Board of Education and was vice president of the board from 1995 to 1996.

**CHANGES IN THE ADMINISTRATIVE STRUCTURE SINCE 2002:** To assure enhanced mission fulfillment, significant changes in administrative structure have been implemented since the previous Middle States decennial report. Three changes deserve special notice. First, the post of Associate Provost for Academic Affairs was created in May 2004. The Associate Provost for Academic Affairs coordinates academic policy formulation and implementation for the Office of the Provost. This administrative change supports education development activities including planning with other institutions such as higher education and state and federal agencies and aids in implementation of the Provost's academic initiatives. Consistent with the *Strategic Plan, 2004-2010*, the Vice President for Research and Development was renamed Senior Vice President for Research and Development and its reporting structure was changed from the Office of the Provost to the Office of the President. Other changes included the division of the General Counsel and Vice President for Human Resources position into two distinct offices: General Counsel and Human Resources. Second, university communications were strengthened. Since 2002, the Office of Communications had been divided into University Communications and Web Services; in the fall of 2010 the two offices reunited under the Office of Strategic Communications to strengthen the impact of the university's communication efforts as called for in the *Strategic Plan 2010-2015*. Under the Office of Strategic Communications, the Director of University Web Services now reports to the Executive Director for University Communications. Changes in the Graduate Studies and International Students and Faculty offices were accompanied by a new position, the Associate Provost for Graduate Studies replacing the former Dean of Graduate Studies position—a third significant administrative change. The processing of graduate nomination forms function was moved from Graduate Studies to the Financial Aid Office under the direction of the Vice President for Academic and Student Services. The activities of the International Students and Faculty office were divided for greater service, with personnel for processing visas for faculty moved to Human Resources, those responsible for graduate research and teaching awards



moved to the Financial Aid Office, and the Director and Associate Director moved to positions under the Vice President for Academic and Student Services. While previously reporting to the Office of the President, the Office of Institutional Research and Planning now reports to the Office of the Provost to enhance cohesive, information-based decision-making.

**FACILITATION OF PRODUCTIVITY:** The mobilization of the administration and the university community toward improvements in education, research, economic development, and service occurs primarily through the strategic planning process. This process builds consensus among stakeholders for strategic goals designed to facilitate productivity and allocates financial support and other resources toward the achievement of those goals. Specific evidence for the ability of administrative structures to facilitate productivity improvements can be seen in various workshops organized by the Provost's Office, as well as the Teaching, Learning and Technology workshops, and other educational sessions. The Department of Human Resources conducts a new-employee training workshop and new-faculty orientation. Staff members are reviewed annually for performance and merit awards, designed to encourage continuous improvement. The university community is encouraged to participate in public outreach and volunteerism through the Civic Engagement program run by Career Development Services. NJIT strives for improvements in economic development through programs such as the Enterprise Development Center, a business incubator that is home to 85 high-tech and life-science companies. Instructionally, a major part of the feedback to faculty on teaching is through the student course evaluations administered every semester, now innovatively conducted online to ensure that the evaluations are distributed and collected in a uniform manner.

Key to facilitation of productivity is the new Performance Based Salary Increase Distribution System (PBSIDS) for faculty, first deployed in the fall of 2010, with salary increases awarded in the spring of 2011. Faculty activities are aggregated into distinct categories, such as teaching, funded research, scholarship, and service, and entered into the digitally-based *Activity Insight for Faculty* system. Performance assessment is then based on the information entered, and the information has yielded a precise understanding of the way that faculty fulfill the NJIT mission through their varied activities. (An analysis of the Performance-Based Salary Increase Data System [PBSIDS] is provided in Chapter 6.)

**EVALUATION OF ADMINISTRATIVE EFFECTIVENESS:** Effectiveness of administrative units is measured through surveys and evaluations by the shareholders served by the administration. Student satisfaction surveys are undertaken, analyzed, communicated, and published yearly. Surveys of the Department of Human Resources are also taken annually, and a faculty evaluation of senior administrators is undertaken every three years, as required by the *Faculty Handbook*. The Director of University Audits has developed a Master Audit Plan, updated annually, that involves regular reviews of performance, with resulting findings and recommendations going to the Audit and Finance Committee and the reviewed departments, who are then responsible for generating a Management Action Plan of the Board of Trustees response. (An analysis of evaluative practices of institutional assessment is provided in Chapter 7.)

**CONCLUSIONS:** Working Group 3 was charged to determine compliance with MSCHE Standard 5: Administration. The Working Group found that NJIT had achieved exemplary performance in identifying and retaining a president appropriate to NJIT's mission who had the combination of academic background, professional training, orientation to strategic planning, and demand for transparency. The Working Group found that NJIT had achieved exemplary performance in identifying and retaining administrative leaders with appropriate skills, degrees, and training to carry out the responsibilities and functions integral to the NJIT mission.

Emerging excellence was identified in the following areas: identification and retention of a president whose primary responsibility is to lead the institution toward the achievement of its mission; use of information and decision-making systems, such as *Project ORBIT*, to support the work of administrative leaders; and clear documentation of the lines of organization and authority.

The Working Group found that NJIT had met the standard for qualified staffing appropriate to the goals, type, size, and complexity of the NJIT mission. The Working Group also found that NJIT had met the standard for periodic assessment of the effectiveness of administrative structures and services.

**STRATEGIES FOR THE FUTURE:** After extensive deliberation on the university's administrative structure, NJIT has identified the following areas of improvement. These two areas will be integrated into the strategic planning process:

1. NJIT will prioritize and identify budgets to fill key vacancies in a timely manner in accordance with strategic planning initiatives and institutional priorities;
2. NJIT will integrate institutional assessment strategies into the evolving model of shared governance through continuing periodic review of administrative functions, structures, policies, and services.

## CHAPTER 6. NJIT INTEGRITY

**STANDARD ADDRESSED:** This chapter addresses Standard 6 of the *Characteristics of Excellence in Higher Education*: Integrity.

**EXECUTIVE SUMMARY:** Integrity at NJIT permeates at two levels. At a macro-level, integrity is included as a core value in the NJIT strategic plan; as such, the university has embraced the state-mandated Uniform Code of Ethics for faculty, administration and staff, and student integrity is guided by the University Code of Academic Integrity. At the micro-level NJIT fosters, assesses and maintains integrity through ethics training, conflict of interest disclosure, and online sexual harassment training, and by providing events highlighting women's issues, cultural diversity, and sexual orientation. NJIT's policies and procedures are designed to ensure integrity in faculty selection, promotion, tenure, retention, compensation, and administrative review.

**INTRODUCTION:** Adhering to the institutional assessment framework defined in the *Characteristics of Excellence in Higher Education*, in the conduct of its programs and activities involving the public and the constituencies it serves, NJIT has demonstrated adherence to ethical standards and its own stated policies, providing support for academic and intellectual freedom.

NJIT is an integrity-driven university. NJIT has integrated, iterative initiatives designed to notify the NJIT community of their rights and responsibilities under the law. The *Faculty Handbook* provides clear guidelines on the practice of hiring employees, both administrators and faculty. The university avoids conflicts of interest by requiring employees to fill out personal business disclosure forms, attendance at events forms, and scholarly capacity disclosure forms. It is known that NJIT does not discriminate against any applicant regardless of age, gender and national origin; it is equally well known that NJIT fosters a diverse working environment and is deeply committed to the welfare of all shareholders.

**NJIT CORE VALUES:** The core values of NJIT resonate with its mission and vision, analyzed in Chapter 1. The core values of NJIT reflect the community's beliefs, guide its behaviors, and shape its culture; in doing so, the core values establish a sense of community and purpose. The university's core values emphasize the following:

- In its service orientation, the NJIT community takes pride in being an engaged partner in enhancing constituent communities;
- In its pursuit of excellence, NJIT is satisfied with nothing less than meeting and sustaining the highest standards of performance;
- In its commitment to integrity, NJIT strives to be honest and ethical in all actions, to keep promises, and to acknowledge mistakes;
- In its devotion to students, NJIT cares for students as individuals and makes every effort to build enduring relationships by responding to student needs;
- In its commitment to civility, NJIT ensures that everyone is treated with respect and with dignity, and that communication is frequent and conducted with candor;
- In its celebration of diversity, NJIT is sensitive to cultural and personal differences. NJIT does not tolerate discrimination in any form.

The mission of NJIT drives its activities, and the vision provides a path for the future. The core values assure a culture of integrity for the NJIT community.

**ETHICS LIAISON OFFICER:** In March of 2008, NJIT created the position of Ethics Liaison Officer. Jean Feeney, who holds this post, has the following responsibilities: to coordinate and manage the ethics program; to review and investigate ethics concerns or allegations of violations; to

develop and implement ethics policies and procedures; to assist the NJIT community in compliance of statutory mandates and regulations; to provide guidance on ethics related matters; and to serve as liaison to the State of New Jersey Ethics Commission. NJIT is strict in its requirement of disclosure forms from faculty and instructional staff to remain in compliance with the Uniform Code of Ethics from the NJ State Ethics Commission.

Under New Jersey State Act 52.34-10.9, ethics training is required of all employees involved in the procurement process. An “Attendance at Events” disclosure is required of each employee prior to attending an event to obtain prior approval. The form specifies that employees are not permitted to accept an honorarium or fee for any activity in which they participated. Yearly disclosure is required of all employees serving at NJIT in a scholarly capacity for all benefits received for engaging in scholarly activity from all sources except benefits received from NJIT. Outside activities, too, whether compensated or voluntary, must be disclosed by completing the State of New Jersey Outside Activity Questionnaire and receiving permission to engage in such activities from the supervisor and the NJIT Ethics Liaison Officer.

The president of NJIT completes a mandatory Financial Disclosure Statement, and the members of the Board of Trustees must complete an annual Conflicts of Interest Disclosure Form. NJIT regularly provides information to employees on an ongoing basis updating them on issues involving ethics. Ethical regulations are prominently posted on the NJIT website, and orientations for new faculty and instructional staff assure their implementation. The Human Resources website further publishes newsletters relevant to ethics and conducts an awareness campaign to notify the NJIT community of rights and responsibilities under the law, regulations, and executive orders. Periodic ethical training is provided by the Department of Human Resources. Such communications and feedback serve as a constant reminder to the NJIT community of the core value of integrity.

**UNIVERSITY CODE ON ACADEMIC INTEGRITY:** While the Ethics Liaison Officer attends to faculty and instructional staff, the University Code on Academic Integrity focuses on students. The university strives to develop and maintain a high level of ethics and honesty among all members of its community. Imperative to this goal is the commitment to truth and academic integrity. This commitment is confirmed in the NJIT University Code on Academic Integrity.

The Code, revised and updated during the 2008-2009 academic year by NJIT administrators and the Student Senate, requires that each student demonstrates honesty and integrity in the completion of all assignments and in the participation of the learning process. Adherence to the University Code on Academic Integrity promotes the level of integrity required within the university and professional communities and assures students that their work is being judged fairly with the work of others. The updated Code defines those behaviors that violate the principles of academic integrity, describes a range of appropriate sanctions for offenses, and identifies a method for promoting the principle of academic integrity on campus. The Code creates clear and effective consequences for code violations through the creation of the XF grade that appears on the student’s transcript with the notation “Failure due to academic dishonesty.”

In addition to specification of violations and consequences, the Code explicitly defines the responsibilities of students, faculty, department chairs and advisors, and others involved in the process to create an environment conducive to academic integrity. Responsibilities of the faculty include communicating the integrity policy and its expectations, assisting in training of new faculty and instructional staff in the policy, providing an environment that contributes to ethical behavior, and reporting violations to the Dean of Students. The Dean of Students maintains anonymity for students who report violations, coordinates gathering of information, and brings

reports of violations to the Committee on Professional Conduct, which handles integrity violations along with many other forms of professional conduct violation. The Code also creates an Honor Commission, whose members are students, faculty, and administrators, specifically for the purpose of creating programs and publicity to promote academic integrity, to assist in an annual seminar on academic integrity, and to keep issues of academic integrity in the forefront of faculty and student organizations. In intercollegiate athletics, the NCAA places great emphasis on academic integrity as one of the operating principles of the NCAA Certification Self-Study. The organization of the NJIT Athletics department was built around ensuring high academic standards for its student athletes.

**INSTITUTIONAL REVIEW BOARD:** In areas of research, NJIT maintains and promotes ethical conduct through the efforts of the Institutional Review Board (IRB) and the Office of Sponsored Research. The NJIT IRB works to assure that researchers fulfill public trust in the research enterprise by putting the welfare of research participants ahead of the interests of the institution or of the researcher's personal financial interests. Any conflicts of interest with the rights or welfare of research participants must be disclosed to the IRB, which determines whether a conflict exists and manages any conflicts in accordance with the best interests of research subjects. Human subjects' protection training is required for all members of research teams. The Office of Sponsored Research ensures that funds provided from external sources to support research and other projects are administered in accordance with university policies as well as those of the sponsor. Promotion of ethical conduct also extends to the intellectual property arena through a contract that university-employed inventors must sign.

**FOSTERING DIVERSITY:** In 2009, 82% of the graduating class of 2013 rated the importance of cultural and life choice diversity from moderately important to very important in their choice to come to NJIT. To support such celebration of diversity among students, NJIT actively engages its diverse population with an array of social events focusing on women, culture, and sexual orientations. Integral to this investment is the ADVANCE initiative analyzed in Chapter 10. The NJIT Campus Center has a Diversity Programs Office that coordinates and funds programs with student clubs. In addition, the Campus Center's Women's Center, home to the Committee on Women's Issues, coordinates with on-campus women's groups, such as the Society of Women Engineers, to ensure a balance in campus programming. As evidence of NJIT's expanded programs, student satisfaction with the campus community and the availability of cultural events has improved from 58% satisfaction in 2006 to a 67% satisfaction in 2010. Students on campus also feel as though they are being dealt with fairly by administration and faculty. This rating has increased from 69% to 72%.

To ensure NJIT's diversity both the *Strategic Plan, 2004-2010* and the *Strategic Plan, 2010-2015* focus on diversity. In the *Strategic Plan, 2004-2010*, specific enrollment targets were established for the following student populations: women (the goal of 15% and enrollment of 17% in 2010), African-American (the goal of 15% and enrollment of 13% in 2010), and Hispanic (the goal of 15% and the enrollment of 22% in 2010). This diversity initiative—to be nationally recognized for attracting high achieving students and faculty from diverse populations—has been continued in the *Strategic Plan, 2010-2015*. NJIT remains committed to attracting and enrolling the best and the brightest from all backgrounds to ensure a rich diverse experience for students and faculty. To that end, in 2006 NSF awarded NJIT a three-year ADVANCE grant aimed at advancing women faculty by facilitating collaborative research networks. An important focus area of the grant is to ensure that women faculty and instructional staff members are not isolated in the workplace, thus improving their potential for developing leadership roles at the university. Integration of studies conducted by the ADVANCE team has fostered a climate of diversity at NJIT. (An analysis of the ADVANCE initiative is provided in Chapter 10.)



**A COHESIVE FRAMEWORK FOR INTEGRITY AND TRANSPARENCY:** Leveraging its status as one of the nation's most digitally advanced universities since 1999, NJIT maintains a wide variety of reporting formats—featuring print, web, and podcasts—to inform shareholders. Copies of all key documents—from student enrollment and graduation rates to forms for compliance with the Ethics Liaison Officer—are available in print formats. Current catalogues are updated and available for web access, and archived catalogues—beginning in 1991 for undergraduate students and 2002 for graduate students—are readily available. The self-study re-accreditation effort has been presented in a podcast series that is often visited and frequently referenced in the NJIT community.

Integrity in the process of promotion and tenure is reflected in published and widely available criteria and policy statements in the *Faculty Handbook* and in documents on the provost's web page. In keeping with the designation of integrity as a core value of NJIT, key sections of the *Faculty Handbook* have been updated to reflect current practice, high standards, and commitment to a transparent process. The updated *Faculty Handbook* provides guidelines for the selection and appointment of faculty and key administrators. The Equal Employment Opportunity Policy is stated in the *Handbook* and is also included on all advertisements for open positions. The *Handbook* assures that tenure and promotion policies are rigorous, clear, and consistent across the university. Similar guidelines to assure integrity in the faculty review process are followed in a rigorous third-year review of all tenure-track faculty members as specified in the *Faculty Handbook* and conducted by the department, dean, and provost.

Equally transparent, performance-based compensation is based on NJIT mission fulfillment. During the period 2002-2009, the merit process was conducted by individual departments based on internally defined criteria agreed to by the department promotion and tenure committee in consultation with the dean. To improve the process and augment equity, in 2010-2011 a new, more centralized system, the Performance Based Salary Increase Distribution System for faculty [PBSIDS] was instituted as part of contract negotiations between the administration and the Professional Staff Association. This current process is more rigorous, adheres to strict criteria that are more uniform across all departments, schools and colleges, and uses a uniform scoring rubric according to set formulas. To ensure the integrity of the process, the detailed reports and results are shared with faculty, who are allowed to make corrections; there is also a process available for appeal. The final summary results are openly available. It is expected that this pilot program will become the model for future years.

Undergraduate and graduate courses are well-planned in sequence by academic departments, and that process is monitored by NJIT Program Review, analyzed in Chapter 14. Course schedules, including syllabi and textbooks, are available on the web page of the Office of the Registrar.

**EXTERNAL REVIEW OF INTEGRITY AT NJIT:** As further evidence of integrity at NJIT, in October of 2007 the State Commission on Investigation released an extensive report examining the governance, oversight, and accountability of post-secondary institutions in the state. The investigation was extensive, and billions of dollars of transactions were reviewed. In the report—*Vulnerable to Abuse: The Importance of Restoring Accountability, Transparency, and Oversight to Public Higher Education Governance*—NJIT emerged as an institution with a capable administrative structure in place, one that maintained effective, efficient, and ethical operating practices. While the Commission noted that additional state oversight would be beneficial across post-secondary institutions, NJIT emerged as a leader in sound, ethically-based fiscal management.

**CONCLUSIONS:** Working Group 3 was charged to determine compliance with MSCHE Standard 6: Integrity. The Working Group found that NJIT had achieved exemplary performance in creating a climate of academic inquiry and engagement supported by widely disseminated policies regarding academic and intellectual freedom.

Emerging excellence, the Working Group found, was achieved in the following areas: fair and impartial processes, published and widely available, to address alleged violations of institutional policies; an environment, coordinated by Dean of Students, that ensures that student grievances are addressed promptly, appropriately, and equitably; fair and impartial practices in the hiring, evaluation and dismissal of employees coordinated by the Department of Human Resources; sound ethical practices and respect for individuals; avoidance of conflict of interest or the appearance of such conflict in all its activities and among all its constituents achieved through the Ethics Liaison Officer; equitable and appropriately consistent treatment of all shareholders; an institutional commitment to principles of protecting intellectual property rights; a climate that fosters respect among students, faculty, staff, and administration; honesty and truthfulness in announcements, advertisements, and recruiting and admissions materials and practices; continuing student access to updated, state-of-the art electronic catalogs, including archived catalogs; institutional information provided in a manner that ensures student and public access in a wide variety of communication formats; and periodic assessment of institutional policies, processes, and practices.

The Working Group found that NJIT has met the standard in the following areas: required and elective courses that are sufficiently available to allow timely graduation; web-based, timely communication of changes and issues affecting institutional mission; availability of factual information about the institution, accurately reported and made publicly available; information on institution-wide assessments available on the web to prospective students; and fulfillment of reporting requirements of MSCHE.

**STRATEGIES FOR THE FUTURE:** After extensive deliberation on the university's commitment to integrity, NJIT has identified the following areas of improvement. These two areas will be integrated into the strategic planning process:

1. NJIT will build on best practices to implement a uniform plan to recruit, mentor, and retain faculty and students from diverse backgrounds;
2. NJIT will re-conceptualize strategies to ensure consistent application of the University Code on Academic Integrity.

## CHAPTER 7. NJIT INSTITUTIONAL ASSESSMENT

**STANDARD ADDRESSED:** This chapter addresses Standard 7 of the *Characteristics of Excellence in Higher Education*: Institutional Assessment.

**EXECUTIVE SUMMARY:** The centerpiece for institutional assessment at NJIT is *ViSta, A Strategic Planning Process for NJIT: Vision-Strategy-Tactics*. This plan for institutional assessment has been used twice in the *Strategic Plan, 2004-2010* and the *Strategic Plan, 2010-2015*. The *ViSta* plan has now been adopted for educational effectiveness efforts.

**INTRODUCTION:** Adhering to the institutional assessment framework defined in the *Characteristics of Excellence in Higher Education*, NJIT has developed and implemented an assessment process that yields an evaluation of the university's overall effectiveness in achieving its mission and goals and its adherence to accreditation standards.

NJIT is an assessment-based university in terms of institutional context. As such, its assessment processes were praised by MSCHE visiting reviewers in both 2002 and 2007 reports. The occasion of the present self-study has been a welcome opportunity to strengthen NJIT assessment efforts for use in assessing institutional goals. Each of the fourteen standards established by MSCHE includes an NJIT periodic assessment of effectiveness as one of its fundamental elements. The NJIT commitment to Standard 7 augments, and makes possible, achievement of each of the other 13 Standards.

***ViSta, A STRATEGIC PLANNING PROCESS FOR NJIT:*** Advocated by President Altenkirch upon his arrival in 2002 and continued by President Bloom, *ViSta* provides a cohesive, evidence-based framework for the strategic planning process at NJIT. As the Board of Trustees, President, and Senior Staff have recognized, NJIT faces many challenges, including changing demographics among its student population, increased competition for financial support from public and private sources, and rapid obsolescence of technology. An effective strategic plan can help the university adapt to—and thrive in—this rapidly changing environment. Strategic planning has enabled NJIT to create a vision of its desired future. *ViSta* has proven to be a powerful tool to assist in the achievement of both the *Strategic Plan, 2004-2010* and the *Strategic Plan, 2010-2015*.

The *ViSta* framework contains three core elements: vision—a statement of the fundamental purpose of the university, its principles, and mission; strategy—the methodology the university has chosen to use to achieve its mission; and tactics—the specific actions the university has decided to take to implement its strategies. *ViSta*, the accountability system used in strategic planning, is the framework used since 2002 at NJIT in assessing the university's progress towards its future goals.

Shareholder involvement is critical to the success of the strategic planning and the *ViSta* framework that supports it. In both of NJIT's strategic plans, individuals engaged in the planning process through participation on the steering committee, department chairs and shareholder groups, or strategic initiative task forces. Shareholders identified include representatives from the following groups: faculty, researchers, administration, alumni, students, Board of Trustees, Board of Overseers, and state and local government agencies. These groups are identified based on their connection to the core mission and goals of the university.

As part of the *ViSta* process, the draft vision of the strategic plan, value propositions, and strategy statements undergo shareholder review. To ensure that the objectives of the strategic

plan are well-designed, each objective is written in the SMART format: to be Specific, an objective identifies exactly what is expected; to be Measurable, the objective is quantifiable; to be Actionable, the objective describes the actions the university will take; to be Realistic, the objective must be both challenging and achievable; to be Time-based, the objective must have a precise completion deadline. With the objectives in hand, draft documents are then disseminated to the NJIT department chairs and key shareholder groups to share with their constituencies and obtain feedback. NJIT department chairs and key shareholders can then submit comments based on constituency feedback to the Office of Institutional Research and Planning (IRP). Comments across departments are consolidated by IRP and provided to the steering committee for their review. A finalized product is produced in workshop format in the presence of the department chairs. Task forces are then appointed to formulate recommendations for each strategic objective. Task force committee composition includes representation from NJIT faculty, alumni, and students.

To assess progress, NJIT uses two tracking systems. Both are inherent in the *ViSta* model. The well-known balanced scorecard approach, the first system, establishes a system for weighing progress and enables communication of progress the university is making toward achieving strategic objectives. Scorecards use a color-coded scoring system that allows shareholders to view performance in a user-friendly format following the metaphor of a traffic light: green (a score of 3) indicates that the strategic plan implementation is proceeding well, with objectives likely to be met; yellow (a score of 2) indicates that strategic plan implementation is proceeding, with objectives likely to be met with achievement of one or more objectives; red (a score of 1) indicates that strategic plan implementation is proceeding, with objectives to be met with concerted effort. Internal tracking of plan performance, the second tracking system, is conducted with milestone assessment reports. These reports include strategic priorities and objectives, baseline, and a baseline final target evaluated by specific metrics. Progress is tracked in this system as target met (score of 3), progress made (score of 2), and opportunity for additional progress (score of 1).

The university-wide strategic planning process and its *ViSta* framework are transparent. The president maintains a public website documenting the following: the planning process; the plan with its strategic priorities, objectives and tactics; and periodic assessment scorecards. He regularly communicates to the campus community through e-mail on strategic planning matters and solicits feedback. All academic units have strategic plans but not all have adopted the *ViSta* planning process in the formulation of their plans. A notable use of the *ViSta* process is evident in *A Strategic Plan for the College of Science and Liberal Arts, 2009-2014*, with the plan's attendant balanced scorecards for each department and its programs.

**THE NJIT STRATEGIC PLAN, 2004-2010:** Objectives of the strategic plan put in place in 2004 have been met: development of a core of nationally recognized programs; improvement in research and intellectual property development; enhancement and enrichment of the quality of life of the university community, with increased focus on the student; achievement of national recognition for attracting high achieving students from diverse national and international populations; and increased revenue from private sources. A detailed year-by-year record of the progress in achieving each of the goals of *Strategic Plan, 2004-2010* is given in the five *Strategic Plan Progress Assessment Reports*, also known as *Milestone Reports*. A similar approach is currently being used in tracking the progress of *Strategic Plan, 2010-2015*. (An analysis of allocation of resources for the five strategic priority areas is presented in Chapter 2.)

**THE NJIT STRATEGIC PLAN, 2010-2015:** Objectives of the strategic plan launched in 2010 are being pursued: enhancement of the quality of academic and campus life for the university

community; establishment of a sustainable base of private support; achievement for thematic core areas of integrated research and learning in sustainable systems, life and healthcare science, engineering, and management, and digital and computing contexts; and achievement of national recognition for attracting high achieving students and faculty from diverse populations. A *ViSta*-based outline has been established, and each objective has been defined by the SMART guidelines. Thirteen task forces perform balanced scorecard assessment. To strengthen the strategic plan through enhanced shareholder participation, during the spring of 2012 President Bloom will host a series of community forums to discuss the university vision and priorities in terms of organizational effectiveness. This iterative process, sponsored by a committee of volunteers from across the university, will recommend strategies to augment the present strategic plan.

**INSTITUTIONAL ASSESSMENT:** The last ten years have seen a significant growth in assessment initiatives. The Office of Institutional Research and Planning (IRP) now conducts nearly a dozen major annual surveys (e.g. entering students, graduating students, alumni, student satisfaction, study abroad) and coordinates participation in national surveys of student engagement and use of technology. Results are analyzed and presentations are made to major campus constituencies and used to inform the planning process. Survey results are published on the IRP website, which provides a record of the expansion of assessment since 2001. To increase the effectiveness of assessment processes, in the spring of 2011 the reporting structure of IRP was placed under the Office of the Provost to create the desired uniformity of institutional assessment and assessment of student learning. (Coherence between intuitional assessment and assessment of student learning is analyzed in Chapter 14.)

**BENCHMARK INSTITUTIONS:** To standardize institutional assessment and establish formal comparisons, NJIT Senior Staff has identified formal benchmarks for use in institutional assessment. These universities are shown in Table 7.0. Institutions were selected using the Carnegie Classification system and actual IPEDS data. Because no other public, diverse, selective, urban technical university exists, each benchmark reflects some characteristics shared with NJIT. All are predominantly STEM institutions with strong research profiles and doctoral programs. Some, such as Georgia Institute of Technology and Lehigh University, are aspirational peers, while others, such as Drexel and Stevens Institute of Technology, are selected because they share an applicant pool with NJIT. Table 7.0 shows the NJIT public and private benchmark universities.

Analyzing the benchmark institutions has offered guidance about trends and best practices in addressing the vicissitudes of higher education in the United States. As a regular assessment of NJIT performance, benchmark data are regularly collected on selectivity, enrollment, retention, graduation, budget, financial aid, and revenue generated by tuition. Additional data are collected for institutional assessment as needed.



Table 7.0. NJIT's Benchmark Institutions

Benchmark Institutions			
University Name	Type	University Name	Type
Auburn University Main Campus	Public	The University of Tennessee at Chattanooga	Public
Clemson University	Public	University of Alabama in Huntsville	Public
Colorado School of Mines	Public	University of Alaska Fairbanks	Public
Georgia Institute of Technology-Main Campus	Public	University of Louisiana at Lafayette	Public
Michigan Technological University	Public	University of Maryland-Baltimore County	Public
Missouri University of Science and Technology	Public	University of Massachusetts-Dartmouth	Public
Montana State University	Public	University of Massachusetts-Lowell	Public
Tennessee Technological University	Public	University of Vermont	Public
Texas Tech University	Public	Virginia Polytechnic Institute and State University	Public
Drexel University	Private	Rochester Institute of Technology	Private
Illinois Institute of Technology	Private	Stevens Institute of Technology	Private
Lehigh University	Private	Wake Forest University	Private
Rensselaer Polytechnic Institute	Private	Worcester Polytechnic Institute	Private

**CONCLUSIONS:** Working Group 4 was charged to determine compliance with MSCHE Standard 7: Institutional Assessment. The Working Group found that NJIT had achieved emerging excellence in providing evidence that assessment results are shared and discussed with appropriate constituents and used in institutional planning, resource allocation, and renewal to improve and gain efficiencies in programs, services and processes, including activities specific to NJIT's mission. The Working Group also found that NJIT had written institutional strategic plans that reflected consideration of assessment results.

The Working Group also found that NJIT had met the standard of documented, organized, and sustained assessment process used to evaluate and improve the total range of programs and services. The Working Group found that NJIT had accomplished its institutional mission, goals, and plans, thus achieving compliance with accreditation standards that meets established MSCHE criteria in Standards 1 through 6 for the institutional context of the university.

**RECOMMENDATIONS: STRATEGIES FOR THE FUTURE:** After extensive deliberation on the university's commitment to institutional assessment, NJIT has identified the following areas of improvement. These two areas will be integrated into the strategic planning process:

1. NJIT will bring consistency into the planning process in order to enhance project tracking and leverage strategies and tactics for success at the unit level;
2. NJIT will develop and use a formal mechanism to ensure all planning models across the university include clearly articulated accountabilities, timelines, anticipated outcomes, follow-up mechanisms, and reporting strategies.

## CHAPTER 8. NJIT STUDENT ADMISSION AND RETENTION

**STANDARD ADDRESSED:** This chapter addresses Standard 8 of the *Characteristics of Excellence in Higher Education*: Student Admission and Retention.

**EXECUTIVE SUMMARY:** The first element of NJIT's mission, as New Jersey's science and technology research university, is excellence in undergraduate, graduate, and continuing professional education, preparing students for productive careers and amplifying their potential for lifelong personal and professional growth. At NJIT, admission is associated with the following processes: educational outreach to the broader community; recognition of the complexities associated with the university's commitment to diversity in an urban setting; efficient application and acceptance procedures; provision of financial aid; clear policies with respect to transfer from other institutions; informed advisement; and provision of other timely and effective student support services. Each is important to the achievement of NJIT's educational mission. NJIT seeks to attract students to careers related to science and technology and to provide a comprehensive environment that will guide them to the successful completion of their studies, prepared to commence productive professional careers in their chosen field.

**INTRODUCTION:** Adhering to the institutional assessment framework defined in the *Characteristics of Excellence in Higher Education*, NJIT admits students whose interests, goals, and abilities are congruent with its mission and seeks to retain them through the pursuit of the students' educational goals.

NJIT is an equity-driven, retention-intensive university. By tradition and desire, the university provides educational opportunities for a broadly diverse student population; by intention and design, the university prepares its graduates for positions of leadership as professionals and citizens. Achieving the combined goals of diversity and professionalism—admitting a broad range of students into majors that are challenging—remains a central concern of undergraduate education. In 2002, NJIT held a retention rate of 80% for first-time, full-time first year (FTTF) students registering for their sophomore year, a rate that held constant in 2007. In 2010, that rate was 81%. Between 2002 to 2010, the retention rate has risen to 85% and has not fallen below 80%. Holding these retention rates has taken a concerted effort. In 2002, the NJIT graduation rate was 45%. In 2007, due to equally concentrated effort, that rate rose to 54% and has held relatively steady since that time. While admissions standards, judged by SAT scores, have remained constant—with average scores ranging from 590 to 608 in SAT Mathematics and 520 to 546 in SAT Critical Reading—college readiness remains a challenge in both its behavioral and cognitive aspects.

To ensure a clear understanding of the complexities of educating students in fields requiring advanced mathematics, science, and language skills, on February 3, 2011, President Altenkirch created a Task Force on Undergraduate Retention and Graduation. The Task Force was charged with examining recent national findings on college completion rates, benchmarking NJIT's graduation rate, and identifying strategies to improve that rate. The final report of the Task Force was submitted on May 15, 2011; the report included a vision, strategies, tactics, and measures designed to increase the graduation rate for the state's sole public institution devoted to advanced instruction and research in the applied sciences and technology. The report, along with efforts from 2002 to the present, substantiates that NJIT applies similar methodologies to the assessment of educational effectiveness as it applies to the assessment of institutional effectiveness. (An analysis of the Task Force is provided in Chapter 13.)

**NJIT ADMISSION GOALS AND CHALLENGES:** During the first half of the period from fall 2002 through fall 2010, the number of applications remained constant with small variations between 2,550 and 2,600 undergraduate students. In the second half of this period there was a very dramatic growth in the number of applications reaching 4,398 in 2010. The percentage of women applicants grew over this period from a low of 20.1% in 2002 to a high of 27.4% in 2010. The acceptance rate fluctuates, but shows a significant upward trend over this period. The FTFTF yield, the percentage of acceptances resulting in enrollment of a FTFTF student, dropped rather dramatically in the last two years of this period. The FTFTF enrollment shows very healthy growth with some volatility. The percentage of women enrolling as FTFTF has also increased.

Evolving from its earlier status as an engineering college (a topic analyzed in Chapter 1), NJIT is now a comprehensive post-secondary institution recognized by *US News & World Report's Annual Guide to America's Best Colleges* as a top-tier national research university offering bachelor's, master's, and doctoral degrees. NJIT is now ranked 138 among the nation's best national universities. Every year for the past five years, NJIT has increased its ranking on this widely-read assessment of the nation's colleges and universities.

These rankings are a result of the university's strategic priority to develop and offer programs in engineering, architecture, science and liberal arts, computing, and management that will attract, retain, and graduate a diverse student body. Over the past decade, NJIT has focused on recruiting and supporting undergraduate and graduate populations consistent with this aim. Among the strategic priorities set out in the *Strategic Plan, 2010-2015* is to be nationally recognized for attracting high achieving students and faculty from diverse populations. Specific targets include the following: securing an overall enrollment of 11,000; recruiting a diverse mix of undergraduates reflective as possible of the demographics of New Jersey and at least 25% women; ensuring an increase in the middle 50<sup>th</sup> percentile for enrolled FTFTF from 480-580 for SAT Critical Reading to 500-600 and from 550-650 for SAT Mathematics to 570-670; maintaining a minimum of 15% Dorman Honors Scholars and 15% Educational Opportunity Program participants in the first-year class; and achieving a FTFTF retention rate of 86% and a graduation rate of 60%. As these targets are pursued, the university has remained committed to maintain its pursuit of excellence in the delivery of undergraduate, graduate, and continuing professional education. (An analysis of *Strategic Plan, 2010-2015* is presented in Chapter 7.)

NJIT's commitment to educating a diverse student population in science and technology has earned uncommon honors. NJIT's rankings for 2011 reflect its commitment to diversity, quality of education, and social responsibility. Its diversity was reflected in the *U.S. News & World Report's 2012 Annual Guide to America's Best Colleges* where it ranked as 3<sup>rd</sup> in the nation for most international students. Further, *Diverse Issues in Higher Education* featured NJIT among the Top 100 Degree Producers for 2011 for awarding undergraduate and graduate degrees to minority students. In particular, for undergraduate degrees, NJIT ranked 21<sup>st</sup> in engineering, 27<sup>th</sup> in architecture, and 29<sup>th</sup> in engineering technology among African-American degree recipients; 8<sup>th</sup> in engineering technology, 13<sup>th</sup> in architecture, and 14<sup>th</sup> in computer and information sciences among Asian-American recipients; 6<sup>th</sup> in engineering technology, 15<sup>th</sup> in computer and information sciences, 18<sup>th</sup> in engineering, and 21<sup>st</sup> in architecture among Hispanic recipients; 15<sup>th</sup> in computer science, 22<sup>nd</sup> in architecture, 25<sup>th</sup> in engineering, and 29<sup>th</sup> in engineering technology among all minority undergraduate degree recipients. For graduate degrees, NJIT ranked 4<sup>th</sup> in engineering and 6<sup>th</sup> in engineering technologies among African-American master's recipients; 5<sup>th</sup> in engineering technologies, 19<sup>th</sup> in engineering, 25<sup>th</sup> in architecture, 27<sup>th</sup> in mathematics and statistics among Asian-American recipients; 3<sup>rd</sup> in engineering technologies and 17<sup>th</sup> in engineering among Hispanic recipients; and 5<sup>th</sup> in engineering technology, 17<sup>th</sup> in engineering, 21<sup>st</sup> in mathematics and statistics, and 48<sup>th</sup> in architecture for all minority master's

degree recipients. The *U.S. News & World Report's 2012 Annual Guide to America's Best Colleges* also recognized NJIT's commitment to the quality of education, where it was ranked by guidance counselors at the nation's top high schools as 124<sup>th</sup>. In addition, NJIT's Newark College of Engineering ranked 82<sup>nd</sup> among engineering schools with doctoral programs and the School of Management ranked among the 261 best undergraduate business programs. *Forbes* magazine ranked NJIT among its 650 best colleges, 202 among research universities, and 157 among colleges in the Northeast. The *Princeton Review* listed NJIT among its Best 373 Colleges for 2011. Other noteworthy rankings reflected that NJIT's academic programming is informed by market realities: The *Bloomberg Businessweek* survey ranked NJIT in the top 10 percent nationally for return on investment and classified it as one of four higher education "best buys" in New Jersey. Payscale.com ranked NJIT fourth among state universities for salary potential, both at the entry-level and mid-career. In the area of social responsibility, the *Princeton Review* ranked NJIT among the most environmentally responsible in the *Review's Guide to 311 Green Colleges*, while the Corporation for National and Community Service named NJIT to the President's Higher Education Community Service Honor Roll for the second year in 2011.

The natural tensions among NJIT's aspirations to increase enrollment, diversity, and academic quality have required difficult decisions in recent years owing in no small part to dramatic decreases in the state's financial support for the university, a topic analyzed in Chapter 3. Managing the economically challenging times that NJIT is facing—along with other post-secondary institutions in New Jersey and across the nation—has been complicated by a substantial outmigration of students from the state. Overwhelmingly, NJIT applicants are from New Jersey, yet the number of New Jersey high school students indicating an interest in STEM disciplines is declining in both absolute number and percentage. In 2010 college-bound seniors report issued by the College Board, student surveys indicate that only 6% of students are interested in studying engineering. The 2010 *Report of the Governor's Task Force on Higher Education* found that, in the fall of 2008, 31,510 first-year students in four-year degree-granting institutions who graduated in the previous 12 months migrated from New Jersey. Only 4,167 first-year students came from another state to attend a four-year college in New Jersey; therefore, there was a net outmigration of 27,343 students. New Jersey can no longer ignore this is a loss of resources and talent, the *Report* argued.

To meet these challenges, NJIT has created and implemented a carefully designed recruitment plan to fulfill its educational mission.

**ADMISSION STANDARDS:** The general academic standards for the admission of first year, full-time students have not varied substantially since 2002. The major criteria for admissions at NJIT are a minimum SAT composite of 1050, or ACT composite of 23, an academic record placing the applicant in the top 25% of his/her graduating class (or approximately a 3.0 GPA); and three or four years of mathematics as appropriate for the major. With few exceptions the admission standards do not vary substantially among majors.

In May 2006 NJIT engaged the consulting firm of Noel Levitz to advise the university on its enrollment management organizational structure and strategies. The report suggested that the marketing and communications support systems were appropriate for identifying the message and image of NJIT in developing publications, in placing advertising, and in providing web support. Supported by such findings, the Enrollment Management Committee (EMC), comprised of key academic and administrative staff, continues to meet monthly to discuss and coordinate prospective student recruitment strategy. The EMC is a significant entity in assessing the effectiveness of existing recruitment campaigns. Committee members provide guidance and advisement on recruitment tactics and processes for both undergraduate and graduate student recruitment. They consult on web page design, content for printed marketing materials, and media placement for advertising communications. White Whale Web Services, a consulting team, was retained by NJIT to design the new university website. The updated site effectively communicates the NJIT message while engaging viewers in the university's culture. The site also appeals to out-of-state students.

The size and profile of NJIT's entering classes are initially proposed by the Office of Admissions and Vice President for Academic and Student Services and are subsequently discussed and reviewed by the deans and the Provost. Important factors that come into play are current enrollments, degree program capacity, scholarship budgets, campus infrastructures (such as classrooms, laboratories, and residential space) and instructional capacity, including faculty and instructional staff. While the admission standards are reviewed each year with deans, these standards have not varied significantly over the past decade.

In terms of student performance, the Office of Admissions maintains awareness of the performance of students in the student cohorts through reports issued by the Office of Institutional Research and Planning. (The program review process is analyzed in Chapter 14.)

**UNDERGRADUATE PLACEMENT:** The profile of the first-time full-time undergraduate population has become increasingly competitive. Although students accepted to the Albert Dorman Honors College are required to have a minimum 1250 combined SAT score, the average SAT combined score for the fall Dorman 2010 class was 1335. There has also been an increase in the Advanced Placement (AP) and college credit courses first-year students receive. In fall 2010, 65% of Honors College first-year students received advanced credits as compared to the 54% of the fall 2008 Honors College first-year class.

Students who have not been admitted as honors students are placed using SAT scores and high school transcripts. Students with potential weaknesses are placed into lower level preparation courses before being allowed to take first-year classes, a process that has been reviewed by the Task Force on Retention and Graduation. Institutional Research and Planning has undertaken detailed analysis to identify factors that drive student retention and factors that place students at-risk for graduation. These studies, many presented at national conferences and published in peer-reviewed journals, establish the importance of student academic preparation, academic performance, and student persistence in the first year to sophomore year.

**UNDERGRADUATE RECRUITMENT:** NJIT pursues multiple strategies to overcome growth challenges and achieve its recruitment and diversity goals. Maintaining a minimum 15% enrollment of Dorman Honors Scholars, with concurrent maintenance and improvements in the SAT scores of FTFTF students, is achieved through the *Albert Dorman Honors College Strategic Plan, 2008-2012*. The Honors College growth target of 600 students has been exceeded, and a steady number of honors students will offer an opportunity to ensure academic quality.



NJIT has also had remarkable success in the Educational Opportunity Program (EOP) and Aptitude to Succeed (APT) project. Established at NJIT in 1968, EOP admits educationally and economically disadvantaged New Jersey students to full-time study. These are students whose records do not meet NJIT admission profiles in some respects but who are judged likely, with some form of intervention, to succeed at NJIT. EOP students are provided financial and academic assistance to meet the challenges of a rigorous academic environment. APT, a program that began at NJIT in 2005, admits students with composite SAT scores generally lower than regularly admitted students but with good high school records. Early APT cohorts have achieved higher GPAs and have been retained at higher rates than regularly admitted students. It is clear that APT broadens opportunities for underprepared groups by better identifying students likely to succeed than SAT scores alone. NJIT's success with students from underrepresented groups has been recognized in various forums including *Diverse: Issues in Higher Education*, which in 2009 ranked NJIT 11<sup>th</sup> in the nation in graduation of minority engineers.

NJIT is deploying improved technology to support improvements in admissions. The Enrollment Management component of Banner Information Technology, analyzed in Chapters 1 and 5, allows targeted marketing campaigns and rotating web feature stories about students, alumni, and faculty. Traditional print advertising is no longer seen as an efficient and effective means of attracting students.

Maintaining and increasing financial aid is also an important factor in increasing and attracting students to NJIT. Scholarships have doubled in the period from 1998 through 2007. Financial awards have been competitive with those of other public benchmark institutions. In the fall of 2011, NJIT disbursed \$58M in financial aid.

The documented efforts to maintain high levels of safety on campus have mitigated many of the concerns of potential students and their families regarding crime. The NJIT reputation for campus safety is excellent as students indicate in satisfaction surveys.

The Office of University Admissions is well aware that the demographics of New Jersey and the Northeast United States indicate a period of limited growth of high school graduates wishing to major in areas integral to the mission of NJIT. For this reason, the undergraduate headcount is expected to grow modestly beyond its current size.

**GRADUATE RECRUITMENT:** Graduate student enrollment has declined over the past five years, with 2,824 students enrolled in 2010. Increasing the graduate student enrollment from the current 31% of total enrollment to 37% is a critical component of attaining the overall enrollment goals established in the *Strategic Plan, 2010-2015*.

NJIT traditionally draws a large percentage of its graduate student population from outside of the United States; hence, international recruiting plays a major role in the formation of the university's overall student body. In previous years, student demand far outstripped the university's ability to accept students, and no international recruitment strategy was needed. The university had a large number of well-qualified applicants and could be very selective in its admission process. This applicant pool substantially shifted after the events of September 11, 2001. Visa restrictions have tightened, leading to fewer international students applying to US colleges and universities.



Recent enrollment trends indicate that these numbers are nevertheless rising. Targeted scholarships are used to recruit international students. Graduate students are eligible for the Masters Fellowship, which provides \$2000 per semester per student. Past efforts in the area of international student recruitment include agency-sponsored overseas recruiting trips, and individual faculty members have recruited in their home countries, primarily India and China, for targeted recruiting. At the present time, the university is implementing a coherent, long-term strategy for international student recruitment. NJIT has recently entered into an agreement with IDP Education, a company that has counseling centers worldwide, notably in countries in which NJIT recruits international students. In these countries, IDP hosts college fairs to recruit students. A planned pilot program in India and China is under review; if undertaken, the results will be evaluated according to the institutional and student learning assessment programs analyzed in Chapters 7 and 14. Additionally, in response to the rapidly growing and changing market for online degree programs, NJIT began in 2010 to work with Embanet Compass Knowledge Group—a partner with colleges and universities who have expertise in the not-for-profit online higher education market—to enhance the student experience in three NJIT online graduate programs that demonstrate academic excellence, meet students' high expectations, and deliver a quality learning experience: the MS in Civil Engineering, and Graduate Certificates in Construction Management and Project Management. The first cohort of students began their studies in the summer of 2011.

New strategies have also been developed to increase enrollment, with emphasis on increasing international students. The new Banner Client Relationship Management system (CRM) allows the more effective management of the graduate student applicant pool. The admissions office projects an increase in the number of GRE names purchased for recruitment purposes. A budget has been set aside for this initiative.

Collaboration with peer technology institutions in other countries is another avenue for the expansion of NJIT's graduate student population. A successful example documented by MSCHE is the NJIT association with Beijing Technology University, approved in June 25, 2009, following a site review by Mary Ellen Petrisko, Vice President at MSCHE and the NJIT liaison. This program demonstrates that the design and implementation of international programs of high quality are within the capability of the university. Additionally, in August 2011, the MSCHE Executive Committee for Substantive Change included Amity University (located in India), within the scope of the university's accreditation.

**STRATEGIES FOR RETENTION:** NJIT proactively seeks to retain students. The Center for First Year Students plays a pivotal role in supporting both first-year and transfer students in the successful completion of their first year of study, building a solid foundation for a successful college experience. The center provides a supportive and informative environment that connects first year and transfer students to faculty, staff, and university resources. The center is a clearinghouse for all questions and concerns new students have about academic and social aspects of college during the first year of study. The Center staff offers advice on making students' first year experience successful and rewarding. To help students transition from high school to college, the center explains academic policies and procedures, offers referrals to campus services, including academic support such as tutoring and supplemental instruction. The center assists first year students to engage the university through the many clubs and social organizations available on campus.

The Center for First-Year Students administers placement exams to incoming first-year students and transfer students to ensure that they are assigned to courses appropriate to their level of preparedness. The Associate Dean works closely with faculty and students to resolve academic concerns or issues and coordinates the first-year seminar and academic advising programs.

All first-year students are assigned a faculty and instructional staff advisor or a professional advisor. In most instances, advisors are assigned from the student's major department. First-year advisors are specially selected for their sensitivity to the needs of first-year students and are supported by workshops and periodic updates of curriculum revisions provided by the Center for First-Year Students. An advisor from a student's major department is also assigned to the student.

Retention efforts within academic departments are integral to NJIT's comprehensive retention effort. The Department of Electrical and Computer Engineering (ECE) offers one model. Two department representatives concentrate full time on advising students. The Student Advisor and Curriculum Coordinator counsels first-year students and sophomores and arranges activities including study groups, learning facilitators, and student clubs. The Associate Chair for Undergraduate Studies is responsible for undergraduate programs and concentrates on contacts with upper division students and transfer students. Each student meets with an advisor during a three-week interval before registration begins. A comprehensive student handbook with detailed description of the curriculum and procedures is available on the web. To engage students early, the department hosts First Year Student and Transfer Student Receptions, a First Year Student Seminar Course, and an ECE Floor at student residence halls. Students live on the same floor and attend several courses (such as calculus and physics) together, assisting first-year students with college academic work and social life, making connections with faculty, staff and upper-class students. Advising and mentoring continue through the senior year, including a capstone senior design project, internship, and information on employment.

In the fall of 2011, NJIT formed an implementation team for Degree Works, a web-based product that enables students and their advisors to review past, present, and future academic coursework to evaluate progress toward degree completion. Degree Works integrates seamlessly with the Banner Student System utilized by NJIT. The intended outcomes of adoption of this system include immediate access to accurate academic planning information, more efficient advising practices, and better process mapping for curricula changes across colleges. Additionally, the potential for data mining in planning course offerings will facilitate timely completion of degree. The timeline proposed by the team suggests rollout prior to the course registration period for the spring of 2013.

**THE EDUCATIONAL OPPORTUNITY PROGRAM:** NJIT's Educational Opportunity Program (EOP) offers academic and financial support, as well as career and personal counseling, to first-time, full time students. Support is also offered to transfer students who received educational opportunity funding at their previous institutions and continue to meet their degree program's eligibility requirements. The EOP staff, directed by Lawrence A. Howell, has a long-standing commitment to providing services to students who are ready to accept the challenges of a rigorous university experience. EOP's mission is to provide educational opportunities and improve educational outcomes for populations traditionally underrepresented in mathematics, the natural sciences, engineering, computer and information science, business, architecture, engineering technology, and in the professions related to these fields.

At NJIT, EOP students find enthusiastic administrators and faculty who help to make participation in the program especially rewarding. Among the program's features are the following: financial support that includes a range of grants, loans, and scholarships; an Intensive Pre-first-year Summer Academic Enrichment Program to prepare students for success in their first semester of college; a Winter Inter-session to prepare students for success in their second semester; counseling and academic advisement throughout students' academic careers; undergraduate research experience opportunities which enable undergraduate students to work with faculty on research projects as preparation for graduate school; the Center for Academic and Professional Enrichment (CAPE) to provide tutoring and academic support throughout the students' academic tenure at NJIT; and access to job and internship opportunities through Career Development Services and academic departments.

**THE TASK FORCE ON RETENTION AND GRADUATION:** The primary method of identifying at-risk undergraduate students is their academic performance. These students may exhibit poor class attendance, lack of engagement in the classroom, and low grades on the mid-term and final exams. During their first year, students with low grades on mid-term exams are given a mid-semester warning by email and letters are also mailed to their homes notifying and encouraging them to take advantage of tutorial services offered at the Center for Academic and Career Enrichment (CAPE). Through self-identification, students are also encouraged to ask for additional assistance. Professors, too, help in identifying at-risk students, who are directed to meet their academic advisor or go to CAPE for remedial help. Students who fall below a 2.0 GPA for two consecutive semesters or fall below a 1.5 for one semester are placed on Suspension Pending. Key programs that play an important role for student retention include the First Year Orientation Program, the Transfer Transition Program, First Year Seminar, the use of academic advisors, and Early Academic Warning and Monitoring Program. These programs and strategies have contributed to boosting student retention.

To strengthen retention and graduation gained by enrollment management, NJIT has completed a study on graduation and retention requested by NJIT President Robert Altenkirch on February 7, 2010. The Task Force charge was specific: "To be recognized for attracting high achieving students and faculty from diverse populations, we must undertake an analysis of the reasons students withdraw and develop and implement retention tactics. It is the purpose of the Task Force on Undergraduate Retention and Graduation to complete an analysis of undergraduate retention and graduation and to recommend tactics for implementation that will yield improvements on both areas."

The Task Force, in turn, reported five motions: that students have access to timely and successful completion of an NJIT degree; that for both calculus-based and non-calculus based courses, there will be no more than one 3-credit intervention for underprepared students; that students will be placed through valid test scores and previous educational experience by mid-April (or when such information is available); that NJIT will create a uniform model of advisement with involvement of faculty in professional development; and that all first-year students will take at most 16 credits per semester, with 18 credits as the exception, not the rule.

The Task Force also made four recommendations: that NJIT examine and improve the placement rate of students into credit-bearing courses and develop an evidence-based plan to reduce substantially the remediation rate for first year students; that NJIT create a unified advisement system for undergraduate students; that NJIT continue to contribute to the state's economic competitiveness by producing professionals who will graduate in a timely fashion and contribute to workforce development; and that the university further strengthen the academic environment at NJIT as demonstrated through retention, improved student achievement, and graduation by permanently establishing a mechanism to examine issues related to retention and graduation under a shared governance structure.

The work of the Task Force serves as further demonstration that NJIT is committed to increasing retention and graduation rates, goals established in the *Strategic Plan, 2010-2015* in a timely, responsible manner. All Task Force work was managed and assessed under the *ViSta* framework, an indication that strategies of institutional assessment are being implemented to gauge plans for educational effectiveness.

**INNOVATION THROUGH LEARNING COMMUNITIES:** Concurrent with the work of the Task Force on Retention and Graduation was an initiative implemented in the fall of 2011. Community Connections, an initiative designed to foster communities of learning, is a program designed, coordinated, and assessed by NJIT's Office of the Provost. As students transition to university life, their experience is more likely to be positive and successful if they gain the support they need. Learning Communities—designed, managed, and assessed under the direction of Associate Provost for Academic Affairs Judith Redling—engage students within a network of faculty, advisors, and peer mentors focused on facilitating this transition and enhancing their learning experience.

The Learning Community structure embraces assessment and advisement and creates an environment where students can celebrate a common purpose with integrity and civility. Social networking is used to form teams before the start of their first semester. With the support of team affiliation in their first year, students begin navigation along an academic timeline to graduation. Opportunities for research and service learning projects embedded in this timeline give greater purpose to the educational experience.

The Learning Communities feature peer mentors, sophomore or junior level students who take a leadership role in guiding first-time students. Mentors have identified themselves strongly with their major (i.e. through club activities, co-op experiences, and other levels of professional development) and have established a network of affiliations with the broader NJIT community. They are experienced with team building and are prepared to facilitate the formation of study groups and connect students with faculty and available campus resources (like tutoring and counseling). Peer mentors are typically assigned to about 12 students in a learning community and engage with students online, in select classes, and other group activities. A peer mentor is an important voice of experience and point of contact for communicating questions or concerns.

As part of the assessment of student learning framework analyzed in Chapter 14, the Learning Communities will be measured by their goals: to contribute to first-year retention to the sophomore year; and to contribute to an improved graduation rate. Assessment of the success of the program is based on student achievement in the NJIT Core Competencies, as well as by analysis of affective aspects of student performance such as collaboration, engagement, and tenacity. In the fall of 2011, 265 students, 21 mentors, 9 advisors, 17 instructors, and 10 staff members were involved in learning communities.

**EXTRACURRICULAR RETENTION EFFORTS:** In addition to the approaches described above, beyond the academic orientation there is a rich array of activities that help orient students to community life, student activities on campus and diverse resources to make their experience at NJIT unique. Specifically, broader retention approaches aim to improve the quality of student life. Student input is sought on food services; campus activities, especially weekend activities, have been increased as have the number of student clubs to engage and actively involve students.

Phi Eta Sigma, a national honor society for college first-year students, is especially noteworthy for advancement opportunities. All first year students are eligible to join who have a cumulative grade point average of at least 3.5 at the close of any full-time curricular period during their first year. Phi Eta Sigma is an outward recognition of personal accomplishment and serves as an incentive for continued academic achievement. It provides students the opportunity to meet scholars from all academic disciplines on campus and to join them in promoting academic excellence and campus community service.

**TRANSFER TRANSITIONS:** NJIT has a comprehensive transfer and advisement program. Before the beginning of the fall and spring semesters, transfer students are invited to attend a transfer orientation program. Departmental academic advisors are available for review and awarding of transfer credits and academic advising. Students also have an opportunity to speak with representatives from Registrar, Bursar, Financial Aid, Admissions, EOP, Health Services and International Students offices. NJIT has well defined articulation and joint admissions agreements with community colleges in New Jersey. The joint admissions program allows a student to enroll at a community college and complete the appropriately designated associate degree program. Students can then transfer to NJIT in order to complete their bachelor's degree. Admission to NJIT is guaranteed for students who complete their degree and maintain at least a 2.0 GPA. As well, NJIT has a well-defined system to review transfer credit from New Jersey community colleges. Students who transfer to NJIT from any New Jersey county college review the Comprehensive State-wide Transfer Agreement for guidelines concerning transferability of credits from New Jersey public community colleges to NJ public four-year institutions. Credits for international students are evaluated by World Evaluation Services, Inc. A robust web site is maintained for transfer students.

**CONCLUSIONS:** Working Group 5 was charged to determine compliance with MSCHE Standard 8: Student Admission and Retention. The Working Group found that NJIT had achieved exemplary performance in communicating published and implemented policies and procedures regarding transfer credit.

The Working Group found that NJIT had achieved emerging excellence in the following areas: admissions policies, developed and implemented, that support and reflect the mission of the institution; admissions policies and criteria available to assist the prospective student in making informed decisions; programs and services to ensure that admitted students who marginally meet or do not meet the institution's qualifications achieve expected learning goals and higher education outcomes at appropriate points; accurate and comprehensive information regarding academic programs, including placement testing; and ongoing assessment of student success.

The Working Group found that NJIT had met the following standards: communication of statements of expected student learning outcomes and information on institution-wide assessment results, as appropriate to the program offered, available to prospective students; and accurate and comprehensive information, and advice where appropriate, regarding financial aid, scholarships, grants, loans, and refunds.



**STRATEGIES FOR THE FUTURE:** After extensive deliberation on the university's commitment to admitting and retaining students whose interests, goals, and abilities are congruent with the university's mission and goals, NJIT has identified the following areas of improvement. These four areas will be integrated into the strategic planning process:

1. NJIT will ensure that each student has a clear path to timely and successful degree completion;
2. NJIT will continue efforts in the spirit of the Task Force on Undergraduate Retention and Graduation to ensure ongoing review and revision of admissions, curricula, advising, and other factors contributing to student satisfaction, engagement, and retention;
3. NJIT will design a centralized, cohesive advisement model to improve coordination among current academic support units in order to enhance retention and graduation;
4. NJIT will investigate the impact of innovative programs on student success in order to enhance best practice.

## CHAPTER 9. NJIT STUDENT SUPPORT SERVICES

**STANDARD ADDRESSED:** This chapter addresses Standard 9 of the *Characteristics of Excellence in Higher Education*: Student Support Services.

**EXECUTIVE SUMMARY:** NJIT maintains a robust, well-articulated system of student support services under the auspices of the Vice President for Academic and Student Services. Students apply to NJIT primarily because of its academic programs. To foster their education and personal development, carefully designed programs are offered to support student engagement and sustained enrollment.

**INTRODUCTION:** Adhering to the institutional assessment framework defined in the *Characteristics of Excellence in Higher Education*, NJIT provides student support services reasonably necessary to enable each student to achieve the institution's goals for students.

NJIT is a student-centered university. The vision of a student-centered campus was originally promoted by President Emeritus Saul Fenster, was carried forward by President Robert A. Altenkirch, and is vigorously embraced by President Joel S. Bloom and Provost Ian Gatley. NJIT Student Support Services are organized under the auspices of the Vice President for Academic and Student Services. Reporting to the Vice President are the following: the Associate Vice President for Enrollment Services, who oversees Admissions, Registrar, and Financial Aid; and the Dean of Students, who oversees Residence Life, the Campus Center and Student Activities, Health Services, the Center for Academic and Personal Enrichment, the Center for Counseling and Psychological Services, the Office for International Students, and the Center for First Year Students. Also reporting to the Vice President are Athletics, Pre-College Programs, Career Services, Continuing Professional Education, the Educational Opportunity Program, and the Albert Dorman Honors College. A robust, well-articulated system of student services has been an NJIT tradition.

**STUDENT SUPPORT SERVICES AND STUDENT ENGAGEMENT:** From Student Orientation to Career Development Services, NJIT is committed to offering a wealth of structured opportunities for academic success and personal growth. Symbolically, the new Campus Center—home base for a growing number of student clubs, a re-invigoration of Greek life, and campus traditions—serves as the hub of educational and social activities for the community. Strolling from the Center to classes, students keep time by the carillon and its fifteen minute chimes.

**STUDENT ORIENTATION:** There have been significant changes to the administration, design and intended outcomes of orientation. In 2002, the first-year orientation program, originally called Miniversity, occurred in 12-14 small sessions of up to 40 students across the summer. Under the new title "Connections Miniversity," the orientation program now seeks to connect students to one another, to their college, to NJIT, and to the City of Newark.

With the creation of the Center for First Year Students came a new design for Miniversity and a focus on engagement. Added to the title "Miniversity" was the word "Connections." The intended outcomes were also expanded. Under the new title "Connections Miniversity," the orientation program presently occurs in 4-5 overnight sessions of 150-250 students. From a student view point, the program seeks to connect students to one another, to their college or school, and to the City of Newark. The intention is for students to feel pleased about their decision to attend NJIT, reassured in their decision by making new friends and mitigating fears about attending college in Newark. During Miniversity, students are introduced to their major field of study and their schedule of classes. They also have an opportunity to choose their roommate if they live on

campus, and have an occasion to meet their academic advisors. From an institutional standpoint, the design allows for a larger incoming class size—from 713 first-time, full-time undergraduates in the fall of 2001 to 903 in the fall of 2011—and allows NJIT to orient the class well before the middle of July. There has also been an achieved economy of scale in dining, entertainment, and degree of variety in presentation.

Connections Miniversity is but one of three components designed to engage students into the NJIT community. The on-line component, Highlander Connections, links students with members of their Miniversity groups and their Cluster Coordinators throughout the summer, providing a comfortable venue for information dissemination and exchange. When first year students arrive in the fall, they enroll in First Year Seminar, a ten-week required course that continues to utilize the Highlander Connections website as a source for out of class activities, articles, and self-assessment instruments. The classroom then becomes a venue for interaction and discussion. Topics include issues of independence and responsibility, adjustment, study skills, and time management, as well as effectively working in groups and dealing with ethical issues. Connections Miniversity is assessed by each participant at the conclusion of the program. The data suggest that since the 2005 implementation and evolution of the current design, between 95% and 97% of participants concluded that their decision to attend NJIT was a good one; students had positive feelings about their college, intended field of study, and the university.

**STUDENT ACTIVITIES:** With the opening of the Campus Center in 2003-2004, student organizations increased from 94 to 106 in a period of two years. By 2010, 2160 of our students (averaging 20 students per organization) were involved in a club or organization, a distinct increase from 1515 in 2002 (averaging 15 students per organization). Currently, the Campus Center oversees over 128 student organizations, and the number continues to grow.

Because the Greek community represented the strongest alumni base and were traditionally represented among the leaders on campus, the administration saw a need to maintain and build upon a valuable community asset. In 2003-2004 the university began its first meetings regarding the creation of a Greek Village. In 2011 the Greek Village Task Force concluded that building Greek Houses was financially feasible for the university.

Among the university's most significant student activities is participation in the Student Senate and the Graduate Student Association. Both organizations play a vital, decision-making role in contexts where students are concerned. Through these two organizations, student voices have a defined role in university governance.

**HOUSING AND RESIDENTIAL LIFE:** In 2002 NJIT residential capacity had reached 1,450 students with the opening of the final phase of Laurel Hall. In 2010 NJIT expanded its housing stock by block leasing 230 beds in the privately owned University Center. Through the years since 2003, NJIT has maintained an occupancy rate of 97-98%. An additional 360-bed residence hall, as well as housing for approximately 240 members of Greek letter organizations, is currently being planned. With the addition of the Greek Village in 2013, NJIT is expecting a continued increase in Greek organization membership and the addition of new national organizations.

**BENCHMARKING TO IMPROVE THE NJIT EXPERIENCE:** As part of the integrated system of assessment described in Chapter 14, NJIT utilized Educational Benchmarking, Inc. in 2011 for an on-line survey of 1,680 resident students, with 937 respondents. Residence Life targeted perceptions of satisfaction levels and learning outcomes in key areas. The results showed significant improvements over EBI surveys conducted since 2001. On a 7 point scale, overall resident satisfaction was recorded at 5.37, the overall learning experience at 5.21 and the overall

program effectiveness at 5.17. These were all significantly higher mean scores than recorded on any of the previous surveys. The highest rankings in our history were also given to safety and security at ( $M = 5.38$ ), hall programming at ( $M = 5.24$ ), room and environment satisfaction ( $M = 5.47$ ), facilities satisfaction ( $M = 5.25$ ) and dining services ( $M = 4.54$ ). Additional high ratings were given to community toleration ( $M = 5.75$ ) and respect for fellow students ( $M = 5.51$ ). Key learning outcomes measured included the ability to manage time, study and solve problems. These averaged a score of 5.26. By national comparison, NJIT placed in the top 30% on overall residence life experience (ranking 79 of 284 participating institutions) and time management (ranking 80 of the participating institutions.) These changes are attributed to the NJIT continuous improvement philosophy and its impact on residence life. Initiatives such as the development of community standards, community policing, continuous dining, on-line room selection, and improved maintenance have made a collective contribution to the student experience.

**ATHLETICS:** In the fall of 2004, NJIT embarked on a five year transition process to reclassify its athletic program to the NCAA Division I level, from Division II. This move was made to gain national visibility and to enhance the transition to a residential campus. Over the five year transition, fundraising for athletics increased, facilities were improved, and student life and visibility were enhanced. Regarding fund-raising for athletics, we note that shortly after announcing the intent to reclassifying the athletic program, the school began an ambitious \$5M fundraising campaign focused on athletics. This campaign was successfully completed in 2009. As part of the fundraising campaign, three facilities projects were successfully completed. In 2003, the original natural grass field was replaced with synthetic grass. This change allowed for the field to be open and used all year long by a multitude of constituents from both inside (intramurals, convocation) and outside the university (community groups). The second project, begun in 2005, was the rehabilitation of parts of the Fleisher Athletic Center. The main gym area received a new floor, improved lighting, a sound system, and new bleachers. The athletic training room square footage was increased, locker room, weight room and office areas were also improved. A final major facility improvement was the addition of the Naimoli Family Athletic and Recreational Facility, opened in January of 2011. This facility adds another almost 25,000 square feet of open space for use by the athletic program, as well as other campus constituencies.

Investment in athletics has increased the number of talented, high-performing students on campus. These scholar-athletes have received national acclaim. In 2010-11, the Women's Tennis Team captured the Great West Conference title, while the NJIT ice hockey team won the Great Northeast Collegiate Hockey Conference Championship.

**TUTORING:** Significant changes have occurred in NJIT's approach to tutoring since 2002. What was once known as the ULC, or University Learning Center, has become CAPE, the Center for Academic and Personal Enrichment. CAPE's name reflects a positive emphasis on enrichment rather than a tutorial function. In part as a result of NCAA requirements, the staff now includes two additional full time academic counselors in addition to the director, associate director and peer tutoring staff, with 40 paid and 6 volunteer tutors. Tutors go through a rigorous training program and are evaluated by each student. Tutors meet regularly to discuss tutoring approaches. The staff conducts regular workshops in time management, study skills, and planning.

CAPE collaborates with the Center for Counseling and Psychological Services in the administration of Testing Accommodations for students with disabilities; CAPE also works with the Center for First Year Students in the administration of the APT program for approximately 65 students admitted part-time and with the Academic Success Program for other under-

performing first year students. In addition, CAPE works with the Department of Athletics to administer the Highlander Academic Support Program for approximately 130 student-athletes. CAPE also provides tutoring in the residence halls and holds study sessions and finals preparation workshops in the Campus Center. In 2010, 765 students, excluding athletes, attended tutoring sessions at CAPE. Assessing the many impacts of CAPE occurs in a variety of ways. CAPE staff report that student-athlete performance was higher than students in general, with an average student-athlete GPA of 2.71. CAPE's tutors were favorably reviewed by 76% of their clients. CAPE's efforts with an identified cohort of 40 under-performing first-year students saw 25 of the students achieve a GPA of at least a 2.0 in the spring of 2010, with five students achieving Dean's List status.

**ACADEMIC INTEGRITY:** Academic integrity cases are handled, as in 2002, through the Office of the Dean of Students. Students who are charged with integrity violations have the option of the case being heard by administrative review or by a panel, which is the Professional Conduct Committee (PCC), consisting of faculty, students and administrators. In 2006 the Committee on Academic Affairs approved modifications to the PCC, making it possible to call the panel together more rapidly. The ability to adjudicate matters in a more timely fashion and the acquisition of turnitin.com has had excellent outcomes. Out of 46 cases adjudicated in 2010, all were found to be responsible for a violation. Each of the students involved declined to be heard by the panel and accepted the conclusion of the administrative review. No student appealed the decision. Assessments of the process have indicated that it is successful. The impact, nevertheless, is less than desired. A recent survey conducted by the NJIT Student Senate suggests that cheating is mostly handled by faculty and goes unreported. The number of cases adjudicated within the system suggests that more work is needed to promote the use of the system by faculty.

**THE COUNSELING CENTER:** At the last decennial review, the Counseling Center was staffed by three psychologists and a counselor, as well as a support staff member and a group of peer mentors. The center supported a population of 8,828 students. Today, the population has increased by another 1,000 students. The center is largely focused on individual therapy. The center also coordinates disability services and psychological health promotion. As of 2010, the Counseling Center changed its name to CCAPS, or the Center for Counseling and Psychological Services, to reflect the full range of psychological and counseling services that are provided. CCAPS has maintained the same level of professional staff and has provided similar services over the past decade, but collaboration with Health Services has increased through activities such as *Student Health 101*, the NJIT on-line health magazine, that appears monthly and reaches far more students than peer mentor promotions.

As is the case with most counseling centers across the nation, CCAPS is a busy place. A waiting list for individual therapy will typically appear by mid-semester. Students on the waiting list are triaged and those with serious needs are immediately seen. Group sessions and workshops are offered around various topics, including procrastination, stress management, test anxiety, grief, and alcohol and other drug (AOD) concerns. CCAPS is staffed with specialists in AOD, multicultural counseling/diversity, and men's issues. CCAPS is also involved at times when students are hospitalized or need to leave campus for risk assessment. The CCAPS Director, the Dean of Students, Director of Residence Life, and Director of Public Safety meet weekly to discuss students of concern. CCAPS also offers a workshop for faculty and staff providing information on recognizing and dealing with stress and is often contacted to provide consultation to faculty and staff. CCAPS staff had 2,586 individual counseling contacts in 2010 and 2951 group contacts—an increase from 2002 with 2,256 individual contacts and 2,659 group contacts.



**DIVISION OF CAREER DEVELOPMENT SERVICES:** The mission of Career Development Services is to assist students and alumni in gaining a clear understanding of their career options and workplace requirements, in obtaining experiential learning opportunities, in developing job search and interviewing skills, and in obtaining meaningful employment in a specialty consistent with their education, experience, and personal goals. CDS conducted over 12,500 career advising sessions in 2010 and facilitated the placement of nearly 400 students in major related co-op work experiences and internships. Students obtained professional experience in a host of positions such as Project Manager, Network Administrator, Applications Engineer, and Research Associate.

CDS is the university's primary conduit linking students, alumni, faculty, and staff with non-profit organizations and schools located in and around Newark and throughout New Jersey. Over 1,500 NJIT students participated in community service activities in 2010-2011; in the majority of cases the assignments were technology- based and related to the students' fields of study. The Division serves employers in staffing their organizations with qualified students and graduates and in developing relationships with university faculty and staff. Over 350 employers visited campus last year and another 8,000 posted technology related job requisitions for NJIT students and graduates. More than 3,500 students attended NJIT career fairs and on-campus recruitment interviews.

In 2010, students were asked to report how they attained employment upon graduation. Sixty-nine percent of the 271 total respondents indicated they found employment through the Career Development Services career fair, on-campus recruitment program, job posting service, or as a continuation of a co-op or internship program.

**STUDENT SUPPORT SERVICES AND SUSTAINED ENROLLMENT:** Programs focused on orientation, activities, housing, athletics, tutoring, academic integrity, counseling, and career development are designed to create an environment of engagement. To complete this design, NJIT provides infrastructure to ensure that commitment principles of effective retention are implemented.

**FINANCIAL AID:** The Office of Student Financial Aid Services (SFAS) is as an organizational unit within the university that embodies continuous improvement, self-assessment of the management of student aid, evaluation of the quantity and quality of customer services to students, and implementation of quality improvement strategies. To continue to meet the increased demands of recruiting students to the university, to deliver efficiently student aid to enrolled students while maintaining compliance, and to insure SFAS upholds its commitment to be a student-centered department within the university through a continuous re-evaluation of processes—these are the daily operating procedures of SFAS.

The Office of Student Financial Aid Services has experienced a significant increase in the volume of work it performs. Student financial aid applications increased from 5,162 to 9,563 during award years (AY) 2002 to 2011, an 85 percent increase in the number of applications reviewed on an annual basis for student aid eligibility. New federal aid programs have made NJIT more affordable. The new programs encompassed: TEACH Grant, Academic Competitiveness Grant and the National SMART Grant. The volume of scholarships, grants, loans, and work-study funds disbursed to students also rose dramatically over the past nine years, from \$29M in AY 2002 to \$58M in AY 2011.

In the past five years there has been a significant increase in summer financial aid as well. Varied computer applications are used to process federal and state aid—and to report, reconcile, and

request student aid funding. NJIT has designed a comprehensive student employment management system, PeopleAdmin, as part of *Project ORBIT* analyzed in Chapter 1. SFAS works to insure full use of NJIT's Federal Work-Study allocation and has deployed a web system for NJIT student employment. In addition, SFAS develops the content for the university Financial Aid web pages included in NJIT's website. The site incorporates information about aid delivery, tax implications, articles, and trends on student loan repayments for recent graduates, and other resources. SFAS has implemented a customer service evaluation program. Since NJIT gained NCAA Division I status, the office has implemented compliance with federal regulations for financial aid to athletes. Scholarships for student athletes are processed in accordance with NCAA regulations. Federal and state financial aid programs continue to develop digital initiatives that SFAS staff members have incorporated into their procedures.

The percentage of financial aid need met for the incoming fall 2009 class was near 70%. This goal positively contributes to retention and recruitment efforts by making NJIT more affordable. According to the *Princeton Review*, NJIT is known for "affordability nationally and in the region" in a survey of academic costs and financial aid. The NJIT average package to students with need for financial support has increased by nearly \$3,000; the average package for students not eligible for financial assistance has risen by \$1,400. NJIT has also implemented and secured Federal Title IV funding for Continuing Professional Education (CPE) certificate programs for the first time in the university's history. This gain makes graduate CPE certificate students eligible for federal low-interest rate loans and secures income for NJIT.

The past several years have witnessed the demand for educational loans outside of the traditional aid system increase. To remain compliant with federal and state ethics codes, NJIT has implemented a thorough review of the private lender selection process by way of a formal Request for Information (RFI). Based on key factors that are beneficial to students, the lenders are ranked and selected by a committee. This process has secured benefits for students.

**UNIFORM COURSE SCHEDULING:** NJIT has consolidated course scheduling, faculty assignments, and space utilization into an integrated process managed by the Registrar and utilizing software designed by Infosilem. The project began in 2007 and is now in operation. The master schedule of courses is designed to support NJIT's academic programs and help students complete their degree requirements in a timely fashion. A consolidated review of student enrollment and degree programs has identified course combinations by class year and major that must be scheduled without conflict. The Infosilem software has helped NJIT schedule these course combinations in conjunction with faculty and classroom resources so that students can register for conflict free course combinations that are required to progress toward graduation. As a result, the first-year class is now scheduled as a group based upon each student's course placements—along with special cohort affiliation such as the Albert Dorman Honors College, the Educational Opportunity Program, and student athletes.

**HEALTH SERVICES:** Retention of students is the result of complex variable interactions, both cognitive and affective, and among the most significant is the role of student health. As such, efforts dedicated to improving health services are an important part of student support services. In 2002, NJIT Health Services staff consisted of two nurses and visiting physicians contracted from University Hospital in Newark. A visiting physician provided two hours of service per day, Monday to Friday. Today, NJIT Health Services has a full-time physician, a full-time registered nurse, and a temporary part-time registered nurse. The full time physician has allowed for greater continuity of care. Health Services provides a full range of primary care, vaccinations, and tuberculosis screening. The function of Health Services has continued to provide primary care to the NJIT international student population, to the growing undergraduate residential population,

and to undergraduate and graduate commuter students. 3,294 students were seen in 2010, doubling the number seen in 2002. The impact of the service is substantial and was particularly important during the H1N1 pandemic. Flu vaccination clinics were offered to the student population during the H1N1 outbreak. Student medical insurance benefits were increased to provide greater major medical benefits, prescription coverage and specialist visit coverage. An on-line insurance waiver for students with existing medical insurance was also instituted since 2002.

**OUTREACH AND PRECOLLEGE PROGRAMS:** The Center for Pre-College Programs was established in 1978 in order to increase access to scientific and technological fields among traditionally underrepresented populations and to improve the teaching of science and mathematics in secondary and elementary schools. Achievement is reflected in the accomplishments of its many pre-college alumni. All programs involve corporate partners, local school districts, non-profit educational organizations, and NJIT. The corporate partners provide classroom speakers, financial support, role models, field trips, and expertise in the teaching of science and engineering. Over two decades of involvement in pre-college science and engineering programs have convinced NJIT and its partners that intervention must begin in the elementary grades. As a result, NJIT has greatly increased its activities aimed at improving science teaching in the classroom and reforming the elementary science curriculum as early as kindergarten. The Center for Pre-College Programs annually serves more than 3,000 elementary and secondary students and their teachers in a variety of programs. Annually, approximately 150 NJIT first-year students, typically from minority groups, have participated in the Center for Pre-College Programs prior to enrolling in NJIT.

**CONCLUSIONS:** Working Group 5 was charged to determine compliance with MSCHE Standard 9: Student Support Services. The Working Group found that NJIT had achieved exemplary performance in designing procedures to address the varied spectrum of student academic and other needs, in a manner that is equitable, supportive, and sensitive, through direct service or referral.

The Working Group found that NJIT had achieved emerging excellence in the following areas: a program of student support services appropriate to student strengths and needs, reflective of institutional mission, consistent with student learning expectations, and available regardless of place or method of delivery; qualified professionals to supervise and provide the student support services and programs; athletic programs that are regulated by the same academic, fiscal, and administrative principles, norms, and procedures that govern other institutional programs; reasonable procedures, widely disseminated, for equitably addressing student complaints or grievances; records of student complaints or grievances; policies and procedures, developed and implemented, for safe and secure maintenance of student records; published and implemented policies for the release of student information; and ongoing assessment of student support services and the utilization of assessment results for improvement.

The Working Group found that NJIT had met the following standards: appropriate student advisement procedures and processes.

**STRATEGIES FOR THE FUTURE:** After extensive deliberation on the university's commitment to providing student support services necessary for students to achieve our institution's goals, NJIT has identified the following area of improvement. This area will be integrated into the strategic planning process:

1. NJIT will coordinate, strengthen, and evolve the existing framework of student support services and academic programs to improve retention and graduation.

## CHAPTER 10. NJIT FACULTY

**STANDARD ADDRESSED:** This chapter addresses Standard 10 of the *Characteristics of Excellence in Higher Education*: Faculty.

**EXECUTIVE SUMMARY:** With superior preparation and career achievements, the excellence of its faculty and instructional staff is crucial to the university's ability to achieve its mission. The faculty and instructional staff of all colleges and schools have developed plans to address the changing needs of education in the 21<sup>st</sup> century. These plans have been in harmony with past and present strategic plans. The current plan, *Building for the Future*, will allow retiring faculty and instructional staff to be replaced according to a well-developed, mission-based hiring plan. To increase collaboration among all shareholders of the university, a shared governance model will augment mission-fulfillment.

**INTRODUCTION:** Adhering to the institutional assessment framework defined in the *Characteristics of Excellence in Higher Education*, NJIT hosts instructional, research, and service programs that are devised, developed, monitored, and supported by qualified professionals. NJIT's national reputation for academic excellence, illustrated at length elsewhere in this report, rests largely on the excellence of its faculty—their superior preparation and subsequent achievements in both teaching and scholarship. Ninety-nine percent of the University's current full-time faculty members have a doctorate or the terminal degree in their field. Ninety-one percent of part-time faculty and instructional staff have doctorates or the equivalent. NJIT faculty are prolific in research and scholarly publication, having produced over 7,200 journal articles during the last 10 years, in addition to books, conference papers, patent applications and patents. In AY 2010-2011, NJIT faculty and research professionals served as principal investigators on new and continuing research awards totaling over \$77M. NJIT faculty and instructional staff are frequent recipients of national and international recognition. In the last few years, seven early-career faculty researchers have won Presidential Early Career Awards from the National Science Foundation (NSF). Dozens of senior faculty have been elected fellows of national societies in their fields. NJIT faculty have been honored with national and international achievement awards and won prestigious fellowships including Fulbright and Guggenheim awards.

NJIT is committed to its faculty and instructional staff. NJIT's instruction, research, economic development, and service programs are devised, developed, monitored, and supported by qualified professionals dedicated to the NJIT mission. All colleges and schools have developed plans to address the changing needs of education in the 21<sup>st</sup> century. These plans are in harmony with university strategic planning initiatives and take into consideration the expected wave of planned retirements that have occurred as part of the faculty separation process. NJIT has made progress in enhancing faculty diversity over the last seven years.

**THE NJIT FACULTY AND INSTRUCTIONAL STAFF:** Table 10.0 provides a demographic snapshot of the NJIT faculty from 2002 to 2011, disaggregating the data by rank, tenure status, gender, and ethnicity.

The total number of faculty is considered in terms of total student population through the student-to-faculty ratio (SFR). NJIT has maintained quality of instruction and research in spite of difficult financial challenges: Between 25% and 26% of the General Operating Budget has gone to faculty support. While over the past decade there has indeed been a cost-related shift from tenured and tenure-track faculty to the use of instructional staff and adjuncts, the full-time

equivalent of tenured and tenure-track faculty and instructional staff has not changed appreciably. Although enrollment has been growing, the SFR has remained stable.

Table 10.0 Demographic Portrait of Faculty, 2002 to 2011

	FY	01-02	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11
Dist	F	2	3	4	4	5	4	3	3	3	3
	M	17	19	18	20	20	20	19	21	21	20
	Salary	122,332	128,676	137,126	139,861	147,168	155,766	162,046	160,946	176,680	181,324
Prof	F	13	12	11	11	7	8	9	11	12	12
	M	103	102	101	102	107	106	102	103	102	106
	Salary	106,336	111,092	115,339	117,121	124,188	130,244	135,610	135,140	145,932	153,068
Assoc	F	12	13	14	15	14	16	19	18	18	19
	M	91	81	80	81	76	79	76	74	76	79
	Salary	84,772	88,885	92,136	92,866	98,777	102,194	105,166	104,391	111,834	114,926
Asst	F	20	15	14	11	13	11	8	9	8	8
	M	43	49	48	55	53	43	38	40	43	35
	Salary	67,192	69,369	71,899	71,999	75,950	78,819	80,038	80,904	83,546	86,232
Lect	F	23	22	18	18	17	15	17	20	27	27
	M	57	60	62	62	62	57	61	57	57	58
	Salary	42,541	43,916	43,063	45,344	47,977	50,687	51,645	50,778	55,412	57,994
Permanent Teaching Faculty		381	376	370	379	374	359	352	356	367	367
URM	#	19	20	19	18	17	18	20	23	24	25
	%	5%	5%	5%	5%	5%	5%	6%	6%	7%	7%

The seniority of the tenured and tenure-track faculty is a significant source of fiscal constraint for the university: decades of salary increases have made for substantial faculty salaries.

Comparative data in the 2010-2011 AAUP Faculty Salary Survey reported in the *Chronicle of Higher Education* bears this out: among New Jersey doctoral institutions, NJIT faculty salaries are rivaled only by those of Princeton University, a private, Ivy League institution with a large endowment. Among public institutions, NJIT faculty rank among the highest paid in the nation. Yet the high salary for NJIT professors is commensurate with the well-documented high cost of living in New Jersey. The substantial compensation also encourages quality senior faculty to remain instead of moving to other universities or to industry. In addition, longitudinal analysis demonstrates that the faculty and instructional staff salaries consistently account for approximately 25% to 26% (21% for tenured and tenure-track faculty) of the university's operating budget. As salaries escalate and as the percent of resources allocated to maintaining the university workforce remains fixed, there has been little room for workforce expansion. As Table 10.0 illustrates, compensation for NJIT instructional staff increased at the end of the 2007 fiscal year. Lecturers were also eligible for increases in 2007, 2008, 2009, 2010 and 2011.

**BUILDING FOR THE FUTURE:** In order to contain the financial challenge of faculty salaries, and to maintain and grow NJIT's position as a leading public research university, a substantial new separation offer was negotiated with the Faculty/Professional Staff union, creating an incentive for senior faculty to retire. This Faculty Separation Incentive Program (FSIP) has, as of August 2011, been applied for by 65 tenured faculty members. The funds freed up by the FSIP have been earmarked to hire early-to-mid-career faculty in the years ahead, especially women and Underrepresented Minority (URM) faculty. Because salaries have escalated, the FSIP program is needed to shift the salary structure from a large group at the very top of the scale to a smaller



group at the top and a larger early-career group at the bottom. This shift will allow the university to take the same resources and expand the workforce.

The faculty replacement plan, named *Building for the Future*, is designed to capitalize on the focus achieved by the *Strategic Plan, 2010-2015*. On December 14, 2011, a three-year proposal was reviewed at a special meeting of the Board of Trustees to initiate the hiring of tenured/tenured track faculty and university lecturers. Members of the Board of Trustees have agreed to accelerate the hiring of 12 tenured/tenured track faculty and 9 university lecturers for fall 2012. The plan anticipates the retirement of a significant number of highly valued faculty members as a result of the FSIP. The proposal reviewed by the Trustees included start-up packages and equipment for 31 faculty members through fall 2014. In a coordinated effort, the university is moving aggressively to recruit and hire tenured/tenured track faculty and university lecturers for fall 2012. Phase II faculty recruitment for fall 2015 hiring will be based upon our strategic priorities with the number of hires determined by the final number of FSIP retirees by December 31, 2013.

Hiring for FY 2013 to 2015 is aligned with the thematic core of integrated research and learning in sustainable systems, life and healthcare science, engineering, management, and digital and computing contexts. These thematic area concentrations are aligned with the strategic plans of CoAD, CCS, CSLA, NCE, and SOM, and to be both departmental and multidisciplinary in focus. These plans have been reviewed by senior administration and department chairs.

**DIVERSITY:** Diversity is an important dimension of the NJIT mission. The diverse student population, as well as location within the urban city of Newark, demands that NJIT strive to improve diversity among the faculty and instructional staff. As Figure 10.1 shows, NJIT lags behind its benchmark schools in women faculty and instructional staff. As Figure 10.2 demonstrates, URM faculty and instructional staff at NJIT are presently at 7% and comparable to benchmark institutions. Recognizing the need to increase diversity at NJIT, the university made a commitment in 2005 to enhance the diversity of the faculty to mirror the percentage of African-American, Hispanic, and women terminal degree recipients. Progress continues to be made as NJIT continues to increase its percentage of URM faculty.

Figure 10.1. Women Faculty and Instructional Staff, FY 2010-2011

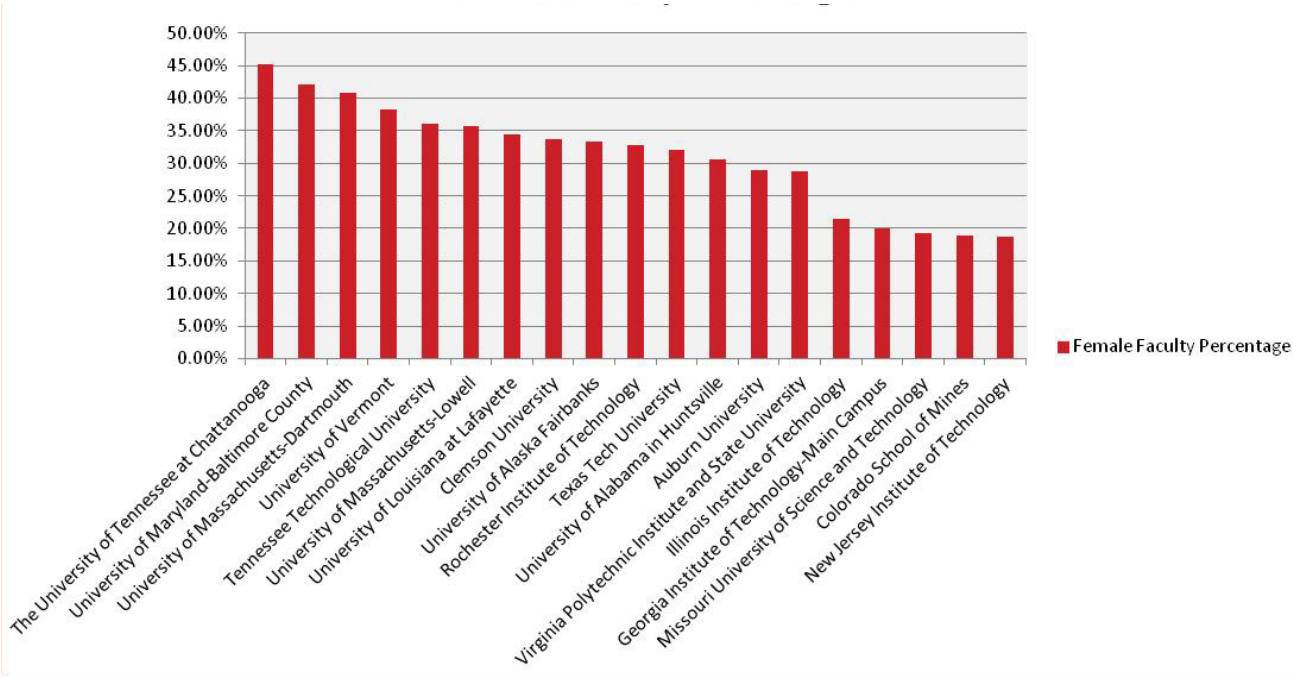
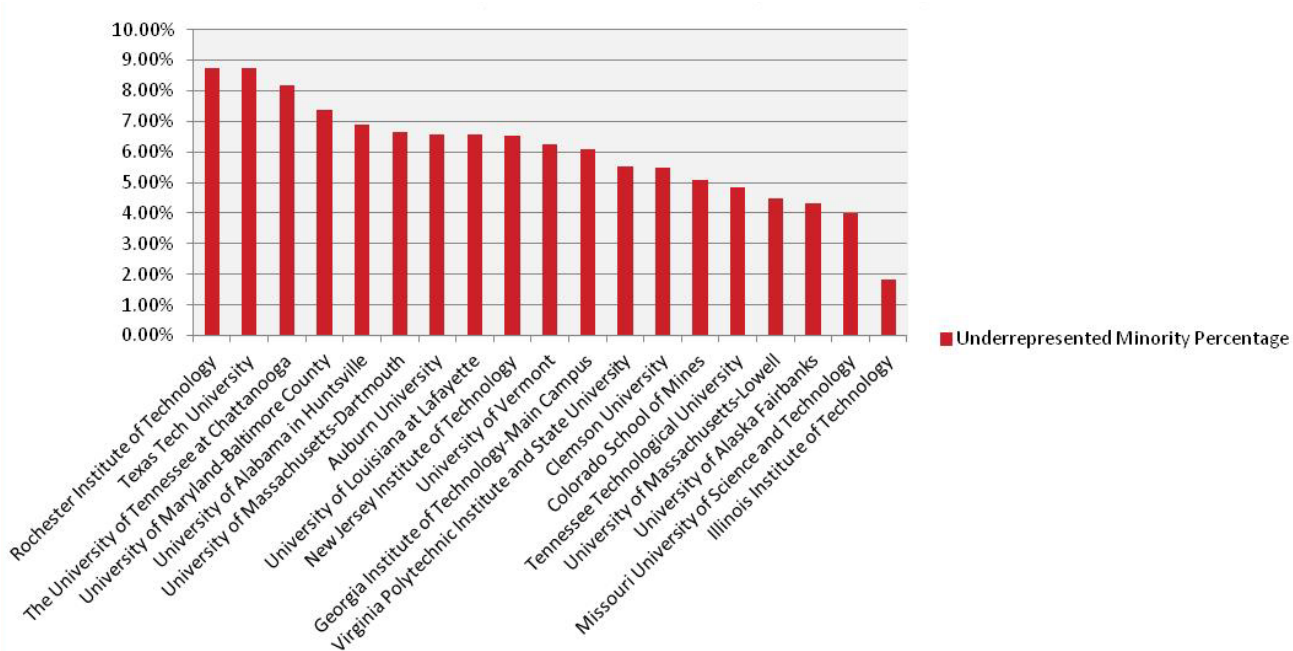


Figure 10.2. Underrepresented Minority Faculty and Instructional Staff, FY 2010-2011



**ADVANCE AND DIVERSITY AT NJIT:** Assurance of the NJIT commitment to diversity is led by faculty, instructional staff, and administrators associated with the ADVANCE effort funded by the National Science Foundation. In 2006, NJIT ADVANCE began a project designed to acquire a deeper understanding of Science, Technology, Engineering, and Mathematics (STEM) research networks and to use that knowledge to create positional advantages for NJIT women faculty, thus diminishing their potential isolation and increasing their information access. During that

period, NJIT researchers led by Nancy Steffen-Fluhr constructed an interactive database containing over 7,200 NJIT faculty publications and deployed statistical modeling and visual mapping to analyze gender patterns in network centrality, establishing correlations between collaboration, network structure, productivity, retention, and career advancement. That research demonstrated that social network analysis could be used effectively to measure the impact of isolation on women's careers. The analysis Dr. Steffen-Fluhr and her colleagues have established between increase in network centrality and female faculty retention meant that NJIT researchers have the ability to picture career landscapes in meaningful ways—and the ability to predict, in real time, who will advance in academia and who is in danger of dropping out. In years four and five of the ADVANCE project, NJIT received additional NSF funding to use this knowledge to create additional leverage for change at NJIT and at ADVANCE institutions across the country.

**MENTORING OF FACULTY AND INSTRUCTIONAL STAFF:** The Promotion and Tenure (P&T) process plays an important role in assuring that standards are applied to faculty performance while offering guidance to enhance career opportunities and professional success. Policies and procedures on appointments, promotions, tenure, and terminations are published in the NJIT *Faculty Handbook*. The P&T committees of all departments review members of the teaching staff and provide written performance evaluations. Especially important in the mentoring process is the third year review, an intensive documented evaluation of the tenure-track candidate's progress towards tenure conducted by the department P&T committee. Here, the chair and tenured faculty describe specifically the candidate's past contributions to the department or school and the university, determining if the candidate is making acceptable progress toward promotion and/or tenure as described in the *Faculty Handbook*. The third year review is used to determine the specific ways the candidate will contribute to the long range goals of the department or school as that unit works towards meeting the NJIT mission.

Chairs of the various departments have established programs to support new faculty hires. For example, the Department of Electrical and Computer Engineering assigns a senior faculty member to mentor a newly-hired member based on similar research and teaching interests. The Department of Mathematical Sciences, as a second example, has a highly articulated mentoring program in which tenured faculty carefully monitor and support early career researchers in their pursuit of research funding, publications, and other activities associated with research. Formal, written classroom evaluations are also made of all tenure-track faculty members. To foster a commitment to service, early career researchers are given committee assignments, such as colloquium or seminar chair, to increase interaction with distinguished researchers in applied mathematics. Both examples are indicative of NJIT's commitment to mentoring faculty and instructional staff within specific academic units.

**THE FACULTY AND EDUCATIONAL COMMITMENT TO THE NJIT MISSION:** Faculty members are deeply involved in all aspects of academic program development, from instruction and assessment to program development and evaluation. Within a well-defined process, department curriculum committees review proposed new programs or courses. New offerings are then reviewed by the Undergraduate Curriculum Review Committee (UCRC) or the Graduate Council. New programs are also considered by the Committee on Academic Affairs (CAA) before their eventual presentation to the full faculty and instructional staff.

The university takes pride in the fact that research-active faculty educate and interact with students both in the classroom and the laboratory. Reflecting the importance of teaching, learning, and assessment on the campus, 45% of the current performance-based salary increase is earmarked for such activities. Equally important is the fact that the P&T process treats teaching effectiveness as critical part of faculty performance. As analyzed in Chapter 14,

teaching effectiveness is measured through student evaluations, faculty evaluations, and student learning assessment techniques. All these are used to evaluate teaching effectiveness. Consistent with the NJIT Program Review Process, all NJIT academic units are required to measure student learning directly, and are then required to use those findings for curricular improvement as well as to communicate the results to shareholders.

New learning technologies, a hallmark of NJIT instruction, are introduced to faculty and instructional staff by the Teaching, Learning, and Technology (TLT) Group, formed in 2000 to improve the quality and accessibility of education at the university.

**THE FACULTY AND RESEARCH COMMITMENT TO THE NJIT MISSION:** Since 2002, the amount of research conducted at NJIT has increased 45.4% from \$69.1M to \$100.5M. The greatest dollar increase has been in federally funded programs. (An analysis of funded research is provided in Chapter 1.) These increases are a measure of the enhanced quality of faculty research. NJIT continues to demonstrate its support for research. As part of the *Strategic Plan, 2010-2015*, core thematic areas—integrated research and learning in sustainable systems, life and healthcare science, engineering, and management, and digital and computing contexts—were identified to guide both research and learning programs—and are presently being used to aid focus of the *Building for the Future* initiative. There was significant participation on the part of faculty in committee brainstorming that identified university-wide strategic research initiative areas. Across the campus, deans and chairs continue to encourage faculty to bring their research experiences to the classroom through the offering of special topics courses, and the practice of embedding research into existing courses. Thus the research-base of the faculty is carried into the classroom at all levels.

**THE FACULTY AND ECONOMIC DEVELOPMENT COMMITMENT TO THE NJIT MISSION:** Faculty members are expected to participate in economic development. For example, the growth in patents—a strategic initiative coordinated by the Office of Technology Development—has resulted in a doubling in Invention Disclosures, as analyzed in Chapter 1. In addition, faculty members participate in NJIT's Enterprise Development Center (EDC), home to 85 high-tech and life-science companies. Located on the campus of the New Jersey Institute of Technology, EDC companies have access to NJIT facilities and can partner with researchers to help grow their business. EDC is in the heart of Newark's University Heights Science Park. (An analysis of the Enterprise Development Center is provided in Chapter 1.)

**THE FACULTY AND SERVICE COMMITMENT TO THE NJIT MISSION:** Faculty service to the NJIT community and the profession at the local, national and international levels is one of the primary mission elements at NJIT. Service activities at NJIT are diverse. At the departmental level, each of the academic departments host committees structured to support departmental activities, guide programs, set curricula, and recruit students, and mentor junior faculty. Department chairs strive to assign committee responsibilities to each faculty member—with care to avoid impacting their research activities—as a way to connect early-career faculty to the community. At the college level, service involves a variety of committees aimed at multidisciplinary activities and strategic planning initiatives in which faculty participation is critical. At the university level, faculty members serve on committees and councils that impact the entire academic community, and form the basis for faculty governance at NJIT. Frequently, university committees provide the opportunity to forge strong relationships and close collaboration between faculty and the administration. One of the key institute committees is the Institute Research Committee. Each member of the Institute Research Committee is also a member of the College Research Committee and also chairs the Department Research Committee, thereby creating a communication and action link.

Service to the profession is reflected in the many faculty members at NJIT who are active with professional societies and serve as leaders at the national and international levels—organizing conferences, chairing sessions and building relationships. In addition, faculty serve frequently on program and proposal review committees for the National Science Foundation and other government organizations, peer review journal manuscripts, and participate in workshops to set research priorities and scope new research directions.

**ACCOUNTABILITY MEASURES:** The Faculty Performance-Based Salary Increase Distribution System (PBSIDS) has been developed by the PSA/AAUP Governing Board and the University administration. The system, launched in 2010, focuses on NJIT's mission and stands on the four areas of the NJIT mission: teaching, scholarship, funded research, and service. Each college and school developed its local standards of achievements, and each department P&T committees recommended standards compatible with the standards of the dean. Individual faculty performance scores are weighted using agreed upon factors to produce a composite score using the Performance Assessment Algorithm score sheet. The composite score is then used to determine individual salary increases. Ninety percent of the performance pool is automatically computed by the system, while the remaining 10% is assigned to individual faculty at the discretion of the dean. The results of the faculty evaluation for AY2009/2010 are under analysis, and the system is expected to continue. Because the system is digitally based—with templates to collect data on teaching, scholarship, funded research, and service—the information can be used for faculty activity reports in these areas. Faculty accomplishments and productivity can thus be electronically maintained and evaluated for various reports at the level of an individual, an academic unit, or faculty as a whole. Such analyses can be stored for future use to examine historical trends among the NJIT faculty. NJIT is justifiably proud of this state-of-the-art accountability system, a further example of the university's dedication to assessment.

**THE FACULTY AND GOVERNANCE:** Shared governance through collegial decision-making is one of the core characteristics that distinguish academic institutions. The importance of strong faculty leadership and broad faculty participation in the governance process cannot be overstated. At NJIT, the basic structure for faculty governance has been established primarily in the activities of two faculty-led bodies: the faculty and instructional staff meetings with guidance and leadership provided by the Faculty Council; and the P&T committees at both the department and institute levels.

The Faculty Council consists of faculty representatives from each of the University's academic Departments. As described in the Council Bylaws, the mission of the Faculty Council is to make the spirit of the faculty and instructional staff felt and its voice heard on all matters of concern to the university community. To enhance faculty governance, the Council provides leadership for faculty meetings and serves as a working committee bringing forward important issues for discussion, providing background information, and presenting action items and motions for consideration. To increase communications, the Faculty Council conducts information forums to provide faculty with information and an opportunity to share ideas on important topics being considered at upcoming meetings.

Faculty Council has been engaged in an effort to reorganize and revise the *Faculty Handbook*. Progress has been made in this effort in accordance with the 2007 periodic review report, and the recommendations for revision have now been completed and approved. Specifically, the Council has brought several revisions before the faculty for consideration and discussion, including a recent change affecting the role of the deans in the promotion and tenure process;



procedures for restructuring departments and colleges; and, other items directly associated with faculty governance.

As analyzed in Chapter 4, there has been recognition that, in order for NJIT to respond to various challenges as the university fulfills its mission in a time of fiscal constraint, a more inclusive form of university governance is desirable. The NJIT Board of Trustees, the ultimate legal authority at the university, agreed with this premise in an April 2011 initiative that authorized the study of how such broader governance might be accomplished. At present, as noted in Chapter 4, a committee formed of all NJIT shareholders, including faculty and administrators, is investigating this issue. This committee is charged with recommending a new governance structure for consideration by the Board in the fall 2011. (An analysis of the shared governance initiative is also presented in Chapter 4.)

**CONCLUSIONS:** Working Group 6 was charged to determine compliance with MSCHE Standard 10: Faculty. The Working Group found that NJIT had achieved exemplary performance in the following areas: educational curricula that are designed, maintained, and updated by faculty and instructional staff who are academically prepared and qualified; recognition of appropriate linkages among scholarship, teaching, student learning, research, and service; published and implemented standards and procedures for all faculty and other professionals, for actions such as appointment, promotion, tenure, grievance, discipline and dismissal, based on principles of fairness with due regard for the rights of all persons; and in adherence to principles of academic freedom, within the context of institutional mission.

The Working Group found that NJIT had achieved emerging excellence in the following areas: faculty and other professionals appropriately prepared and qualified for the positions they hold, with roles and responsibilities clearly defined, and sufficiently numerous to fulfill those roles appropriately; faculty and other professionals, including teaching assistants, who demonstrate excellence in teaching and other activities, and who demonstrate continued professional growth; appropriate institutional support for the advancement and development of faculty, including teaching, research, scholarship, and service; carefully articulated, equitable, and implemented procedures and criteria for reviewing all individuals who have responsibility for the educational program of the institution; criteria for the appointment, supervision, and review of teaching effectiveness for part-time, adjunct, and other faculty consistent with those for full-time faculty; and assessment of policies and procedures to ensure the use of qualified professionals to support the institution's programs.

**STRATEGIES FOR THE FUTURE:** After extensive deliberation on the university's commitment to its faculty and instructional staff, NJIT has identified the following area of improvement. These three areas will be integrated into the strategic planning process:

1. NJIT will review existing programs in order to implement a formal, best practices mentoring program to enhance faculty retention, productivity, and advancement;
2. NJIT will support the faculty hiring plan, *Building for the Future*, as a vehicle to strengthen institutional commitment to core areas, develop faculty diversity, and achieve mission-fulfillment;
3. NJIT will narrow the gap between strategic commitment to increased faculty diversity and the university's ranking in national benchmark data on faculty diversity by accelerating plans to hire and retain women and minority faculty.

## CHAPTER 11. NJIT EDUCATIONAL OFFERINGS

**STANDARD ADDRESSED:** This chapter addresses Standard 11 of the *Characteristics of Excellence in Higher Education*: Educational Offerings.

**EXECUTIVE SUMMARY:** NJIT's mission commits to the pursuit of excellence in undergraduate, graduate, and continuing professional education, preparing students for productive careers and amplifying their potential for lifelong personal and professional growth. Academic programs undergo a rigorous internal and, in cases where programs are agency accredited, external peer-review process to confirm the appropriateness of the academic content as aligned with the NJIT mission and the needs and requirements of industry. In addition, degree programs go through a continuous improvement process through the application of assessment tools that include assessment of core values, institutional learning goals, and core competencies.

**INTRODUCTION:** Adhering to the institutional assessment framework defined in the *Characteristics of Excellence in Higher Education*, NJIT's educational offerings display academic content, rigor, and coherence appropriate to its higher education mission. The institution identifies student learning goals and objectives, including knowledge and skills, for its educational offerings.

NJIT is an education-centered university. There has been significant growth and expansion of academic programs at all levels since the 2007 periodic review. The university presently offers 125 degree programs: 47 undergraduate degrees, 59 master's degrees, and 19 doctoral degrees. NJIT is also authorized to offer 17 graduate certificates. Program growth was initiated in response to constituencies urging NJIT to engage creatively the rapidly changing technological world in which students have matured and will be working upon degree and certificate completion. Their curricula complement the NJIT mission to prepare students for productive careers and to amplify their potential for lifelong personal and professional growth.

All educational offerings at NJIT are unified by the Academic Affairs Core Values: belief in education is a lifelong activity; belief in answering the call of service in a variety of community settings; belief in the exercise of leadership in both professional and citizenship activities; belief in the application of technology to improve quality of life; encouragement of a sense of entrepreneurial inquiry to foster creative growth; adherence to a sense of civility that embraces respect and candor; and celebration of diversity in all cultural contexts. As analyzed in Chapters 12 and 14, these Core Values are implemented in the NJIT Institutional Learning Goals, the General University Requirements (GUR) and the uniformly assessed GUR Core Competencies.

**THE NJIT PROGRAM APPROVAL PROCESS:** New programs result from student and industry demand, disciplinary advances, and faculty strengths. The process begins with a department representative submitting a standard program proposal form that elucidates the need for the program, its potential success, and its relationship to the university mission. The proposal contains the following elements: a rationale; an overview of the constraints and benefits the program will place on and bring to the offering unit; a description of core and required courses and their placement in a four-year curriculum; a clear articulation of how the program best utilizes other NJIT strengths and resources and incorporates the General University Requirements; a comparison of program offerings with NJIT benchmark universities; a listing of comparable programs within New Jersey as well as in the region; expected student FTE yield; and an external consultant's report that indicates the strengths, weaknesses and feasibility of success.

This report is presented to the Undergraduate Curriculum Review Committee (UCRC), in the case of a BA or BS degree program, or the Graduate Council (GC) in the case of an MA, MS or PhD program. Should the program be offered as a joint degree with another institution, memoranda of understanding are created that articulate the full scope of expectancies on the parts of both institutions. In the case of programs developed within departments federated with Rutgers-Newark, the process described here is conducted in parallel with both units. At a UCRC/GC meeting, a representative of the department offering the program proposal discusses the findings of the external consultant and the other content of the proposal itself and presents a motion for adoption of the program. An affirmative vote results in the proposal being re-presented to the Committee on Academic Affairs (CAA), where discussion among chairs, deans and senior administrators concludes with a vote. Passage through CAA results in the program presented to the full faculty and instructional staff; there, comments, critiques and questions are brought up by voting members, discussion leads to a motion for approval, and an affirmative vote is presented to the Board of Trustees for consideration. An affirmative Board of Trustees vote results in a request to the Secretary of Higher Education for program adoption. The Council of Presidents then reviews and recommends approval, when warranted, to the Secretary of Higher Education. (The New Jersey Commission on Higher Education was eliminated in June of 2011 under Executive Order No. 52 from the governor.) The program is then listed in the *Inventory of Degree and Certificate Program Offerings at New Jersey Institutions of Higher Education*, which, updated regularly, contains information about the over 4,100 approved degree and certificate programs at licensed New Jersey institutions of higher education.

**THE PROGRAM ACCREDITATION PROCESS:** Program assessment is an integral component of the continuous improvement process described in Chapter 14. Each professional accrediting agency—the Accreditation Board for Engineering and Technology (ABET) for engineering and computing programs, the Association to Advance Collegiate Schools of Business (AACSB) for programs within the School of Management, and the National Architectural Accreditation Board (NAAB) for programs within the College of Architecture and Design—determines the scope and nature of assessment tools to determine if the current academic content, rigor and coherence are within the needs and requirements of industry and the accrediting agencies. For programs in the College of Science and Liberal Arts that are not professionally accredited, design and assessment have been ensured by *A Strategic Plan for the College of Science and Liberal Arts: 2004 to 2009*, *A Strategic Plan for the College of Science and Liberal Arts, 2009-2014*, and *CSLA Program Goals: Assessment of Student Learning*. Across the university, program objectives and the resulting curriculum of the program are maintained based upon input from several different constituencies that contribute to improving the effectiveness of the program. These include industry and industrial advisory boards, alumni, students, faculty, and staff.

Traditionally, individual student performance has been measured by course materials such as homework, examinations, presentations, projects and grades. These are important performance indicators because they provide both students and their instructors with measured feedback on the student's ability within the context of a specific course. These measurement tools will continue to be used, and examples of student work including videotapes of student presentations will be available to the evaluator. Additional tools are used to assess the overall effectiveness of the program. Departments have generally developed specific assessment tools used with pre-determined frequency to measure program outcomes. These tools—locally embedded and nationally standardized, survey and performance-based—include Exit Surveys, Employer Surveys, Alumni Surveys, Student Feedback Sessions, Standardized Exam Results, External Board Review, Course Evaluations, and Laboratory Evaluations. A relationship between each tool and the program outcomes is also developed. Results of the assessments are reviewed by the departments where recommended changes, if any, are initiated to maintain the academic

content, rigor, and coherence of the program as part of a continuous improvement process. Among innovations designed to strengthen program review, the university has in place an outcomes-based, evidence-centered review of all NJIT degree programs through the NJIT Program Review Process. An analysis of this innovation is provided in Chapter 14.

**THE INDIVIDUAL COURSE:** Undergraduate and graduate courses are well-planned in sequence by academic departments, and that process is monitored by the NJIT Program Review Process, analyzed in Chapter 14. Course schedules, including syllabi and textbooks, are available on the webpage of the Office of the Registrar. As noted in Chapter 6, this new system was launched to improve navigation and enhance student centeredness. Course objectives—linked to program goals that are, in turn, linked to Institutional Level Learning Goals—are thus available to students as they register for courses. In addition, each fall the provost communicates by e-mail with the faculty and instructional staff to ensure uniformity in syllabus design.

**THE ROLE OF STUDENTS:** Students are active participants in their education. Current students provide direct input into the program under two formal modes. One mode is through Student Senate organized feedback sessions, which are held once each semester. Discussion at the sessions ranges from compliments and complaints about individual instructors to suggestions about course content. It is noteworthy that a very substantial number of students are employed with engineering firms, information technology, and other such agencies either part time or during the summer. Thus, they can often provide perspectives that are based in part on work experience. The second mode for students to impact the program is through exit surveys of graduating students conducted by departments.

**THE ROLE OF INDUSTRIAL ADVISORY BOARDS:** College, school and departmental Industrial Advisory Boards are briefed on programmatic activities and provide a professional perspective for program development. The board, in conjunction with the department faculty, often plays a significant role in establishing, reviewing, revising, and maintaining the program level learning goals. Under the NJIT Program Review Process, analyzed in Chapter 14, Industrial Advisory Boards review the congruence between program level learning goals and the NJIT Institutional Learning Goals. Over time, the advisory boards will be able to monitor the NJIT Core Competencies as they are assessed as part of the General University Requirements.

**THE ROLE OF INDUSTRY AND ALUMNI:** NJIT has traditionally maintained strong ties with industry. Departments generally solicit direct input for the program from industry/alumni through the periodic use of surveys. The Employer Survey queries general and specific skills desired by employers, as well as employer satisfaction with NJIT graduates. The Alumni Survey provides program specific feedback about the general undergraduate experience, employability, and progress towards licensing, where applicable.

**THE ROLE OF ADVISEMENT:** NJIT employs a mandatory advisement system. Each semester, every student is required to see one of the advisors within the college, school, or department prior to registration. In order to ensure compliance, a registration hold is placed on each student's electronic registration file. During the meeting the advisor reviews the student's progress and discusses what courses should be taken in the upcoming semester. A curriculum checklist sheet is maintained in each student file to track student progress, and the advisor also completes a registration authorization form. The advisor also makes other notations in the file as appropriate. Following the meeting with the advisor, the registration hold is removed, and the student then registers on-line following the NJIT standard procedure. The mandatory system has proven effective in preventing students from taking courses out of sequence and assuring



that students fully understand the purpose and interrelationship of the requirements of their degree program. (An analysis of the role of advisement is presented in Chapter 8.)

**THE ROLE OF THE ROBERT W. VAN HOUTEN LIBRARY AT NJIT:** The University's Robert W. Van Houten Library supports study, research and computing, with comfortable reading and collaborative work areas. Students and faculty can access most of the library's resources asynchronously from the web. The library houses ample equipment for photocopying and handling non-print formats including videos and microform resources. The collection of 170,186 volumes, including books and bound periodicals, resides in the Van Houten Library and the Littman Architecture Library in Weston Hall. Students and faculty may supplement the NJIT library's print resources by borrowing directly from other libraries through an online system for inter-library loans, and there are walk-in book borrowing and onsite database privileges at Rutgers- Dana Library, with similar privileges available at UMDNJ, Newark and Essex County College, Newark. Hence, browsing libraries are available to NJIT students. In addition, undergraduate and graduate students and faculty have borrowing access to most New Jersey academic libraries through Virtual Academic Library Environment (VALE). Students and faculty also access over a million freely available e-books via Project Gutenberg, Hathi Trust Digital Library, Open Access Text Archive, and Online Books Page.

Books and article copies not owned by NJIT are obtained by the Library staff through InterLibrary Loan (ILL). In 2009 NJIT Library joined RapidILL.org, an interlibrary article delivery resource sharing program, consisting of a prominent nationwide group of academic libraries. It is significant to note that 94% of requests made by NJIT via RapidILL were emailed within a 24 hour period to NJIT requestors. Librarians assigned to colleges, schools, and departments request book orders each fall from the faculty and instructional staff. Journal literature in engineering, science, management, architecture, and other subject areas is accessible through a variety of bibliographic and full-text databases. Today, in keeping with the rapidly changing world of online information, the NJIT community has access to more than 32,000 unique electronic journal titles by database and direct subscription of which only about 76 are print-only. The library currently subscribes to 19 core databases. Most critical in the engineering disciplines are IEEE Xplore, SCOPUS, Science Direct, and Sci-Finder Scholar and the ACM Digital Library. As analyzed in Chapter 3, maintaining these subscriptions is, in a period of constrained resources, a priority.

In addition to eleven group study rooms and one quiet study room on the second floor, the Van Houten Library also hosts a collaboration program that facilitates a small group of 2 to 8 members who are engaged in a group project. TeamSpot users interact via a large display screen as they edit and share group documents while they work at their notebook computers. The Library's Information Literacy training room is equipped with 17 workstations and associated equipment for information literacy workshops. A key focal point is the heavily used Information Commons, a computer lab of over 120 computers located on the main floor of the Van Houten Library. These computers provide students with access to the library catalog and licensed and publicly available electronic resources including books, journals, indexes and databases. Computers are also configured with all the software used to support basic and specialized computing needed across the curriculum. Computer lab assistants as well as professional reference librarians are available nearby to help users.

The library's four full-time technical reference librarians provide individualized consultations upon request and staff the actual and virtual Research Helpdesk approximately 45 hours per week. Virtual reference help is available via email, and instant messaging. Frequently asked questions are answered 24/7 via a self-help online service powered by IntelliResponse. The NJIT



librarians have strong subject knowledge in technology, and among them hold degrees in Industrial Engineering, Chemistry, and Mathematics as well as in Library and Information Science. The technical reference librarians serve as liaisons to each college and school department, providing customized library services and support such as information literacy consultation and library instruction, literature searching, promotion of library services, and collection development with solicited input from faculty and students. A total of 24 full-time employees support the activities associated with traditional and electronic library use.

**THE NJIT INFORMATION LITERACY INITIATIVE:** Led by University Librarian Richard T. Sweeney and the library staff, NJIT has operated under a well-defined, outcomes-based Institute Information Literacy Plan, approved by the Committee on Academic Affairs in May of 2009. The goal of the NJIT Information Literacy Plan is to ensure that NJIT undergraduate students graduate with adequate and competitive information literacy (IL) skills. The plan is intended to meet and exceed the Middle States Commission on Higher Education skills accreditation requirements and the New Jersey Commission on Higher Education (NJCHE) academic licensure rules. IL is the ability to know when information is needed, to locate it efficiently regardless of its location, format or medium, to evaluate its relevance, authoritativeness, and validity, to use it to build new knowledge, and to communicate that knowledge.

As the plan specifies, it is the responsibility of each academic department to provide the necessary instruction within every undergraduate program to ensure that all of their UG students graduate with adequate and competitive IL skills. It is the responsibility of the NJIT library and librarians to assist faculty in identifying and/or developing relevant educational materials, to collaborate with other academic libraries in creating efficiencies, to benchmark NJIT IL programs against peer institutions, and provide guest lecturers within the limits of available staffing and resources. To meet these responsibilities, a written plan of outcomes is submitted for designated courses addressing defined IL objectives in academic majors. To complement and augment the NJIT Information Literacy Plan, a standardized assessment—*iSkills*—is used as part of the assessment plan of the NJIT Core Competencies analyzed in Chapter 14. The NJIT information literacy initiative has received national attention, with attendant national and regional presentations and peer-reviewed publications.

**TRANSFER TRANSITIONS:** As analyzed in Chapter 8, NJIT has a comprehensive transfer and advisement program. Before the beginning of the fall and spring semesters, transfer students are invited to attend a transfer orientation program. Departmental academic advisors are available for review and awarding of transfer credits and academic advising. Digital innovations associated with *Project ORBIT* will allow increasing student-centeredness through increased information regarding transfer student degree progress.

**ADULT LEARNING:** NJIT is committed to education that is professionally focused. Undergraduate, graduate, and certificate students operate within a curricular environment that emphasizes the following: self-directed efforts that are goal oriented toward the NJIT Core Values, Institutional Learning Goals, and Core Competencies; life experiences that allow students to leverage academic knowledge; and relevant, practical examples of academic principles that are applied in organizational settings. In delivery, however, traditional course formats may be insufficient—even with the NJIT professional orientation—for adult learners. As such, NJIT has invested in Continuing Professional Education (CPE) for non-credit and credit offerings. (An analysis of CPE is presented in Chapter 13.)

**CONCLUSIONS:** Working Group 7 was charged to determine compliance with MSCHE Standard 11: Educational Offerings. The Working Group found that NJIT had achieved exemplary

performance in communicating published and implemented policies and procedures regarding transfer credit based on course equivalencies and expected learning outcomes.

The Working Group found that NJIT had achieved emerging excellence in the following areas: creation of educational offerings congruent with the university's mission; design of formal undergraduate, graduate, and certificate programs—leading to a degree or other recognized higher education credential—to foster a coherent student learning experience; use of learning resources, facilities, instructional equipment, library services, and professional library staff adequate to support the institution's educational programs; collaboration among professional library staff, faculty and instructional staff, and administrators to enhance information literacy across the curriculum; creation of programs that promote student use of a variety of information and learning resources; provision of comparable quality of instruction, academic rigor, and educational effectiveness of the institution's courses regardless of the location or delivery mode; practices and policies that reflect the needs of adult learners that are consistent with the institution's mission; and assessment and use of student learning and program outcomes relative to the NJIT Institutional Learning Goals.

The Working Group found that NJIT had met the following standards: design and use of program goals that are stated in terms of student learning outcomes; and use of course syllabi that incorporate expected learning outcomes.

In terms of additional elements for the professional orientation of NJIT graduate education, the Working Group found that NJIT had achieved exemplary performance in graduate curricula providing for the development of research and independent thinking that studies at the advanced level presuppose; and recruitment and retention of faculty with credentials appropriate to the graduate curricula. The Working Group also found that NJIT had achieved emerging excellence in assessment of student learning and program outcomes relative to the goals and objectives of the graduate programs.

**STRATEGIES FOR THE FUTURE:** After extensive deliberation on the university's commitment to its educational offerings, NJIT has identified the following area of improvement. These two areas will be integrated into the strategic planning process:

1. NJIT will provide a professional development framework to all undergraduate degree programs by explicitly aligning each program's vision with the NJIT mission;
2. NJIT will strengthen university-wide objectives and curricular assessment plans by engaging curriculum committees, program directors, department administrators, and continuing and professional education.

## CHAPTER 12. NJIT GENERAL EDUCATION

**STANDARD ADDRESSED:** This chapter addresses Standard 12 of the *Characteristics of Excellence in Higher Education*: General Education.

**EXECUTIVE SUMMARY:** In order to produce graduates who have the knowledge, skills and motivation necessary to advance the state-of-the-art knowledge in their respective fields, all students participate in coursework fulfilling the General University Requirements (GUR). The GUR requirements are intended to provide educational experiences harmoniously attuned to the mission of NJIT. Completion of the GUR is a necessary step in the fulfillment of the implicit intellectual and social contract that NJIT has with its students and its local, national and global shareholders. A process of collaborative review is used to update, monitor, and modernize the GUR.

**INTRODUCTION:** Adhering to the institutional assessment framework defined in the *Characteristics of Excellence in Higher Education*, NJIT's curricula are designed so that students demonstrate college-level proficiency in general education and essential skills, including competency in oral and written communication, scientific and quantitative reasoning, critical analysis, and technological competency.

NJIT is committed to general education. The GUR is designed to be a cohesive force independent of student major. As analyzed in Chapters 11 and 14, the NJIT Core Values (education as a life-long activity, dedication to service, acceptance of leadership, promotion of technology, encouragement of entrepreneurship, adherence to civility, celebration of diversity) and NJIT Institutional Learning Goals (research-based inquiry, ethical conduct, economic opportunity, collaboration, and engagement) constitute the unifying framework for the GUR. Uniformly measured in the GUR are the following: writing, reading, and critical thinking; qualitative reasoning; and information literacy.

**THE GENERAL UNIVERSITY REQUIREMENT AND THE NJIT MISSION:** Historically, courses serving the GUR, as shown in Table 12.0, have been—and are—in a process of continuous improvement to strengthen the NJIT mission. For example, since the last decennial review there has been an increase in computing science and an expansion of options available to students. This expansion resulted from evidence-based assessment by faculty and instructional staff from the Newark College of Engineering that increased instruction in computer programming and applications was needed, in recognition of the fact that students will increasingly be called on to interface with a variety of malleable software systems; conversely, students in majors in which programming is not a significant activity needed alternatives that included the use of productivity software or a general introduction to the history and social significance of computing in the modern world. The College of Computing Sciences rapidly replied to this request.

Table 12.0. The NJIT General University Requirements

GUR DISCIPLINE	DESCRIPTION	NUMBER OF CREDITS	ASSESSMENT	USE
Computing Sciences	An understanding of the nature of computing, its impact on society, and the driving forces behind its pervasive deployment is integral to effective functioning as a professional and as a citizen.	3 credits	Review retention rates in courses; revise course content	Creation of new course model
Cultural History	All educated individuals are expected to understand and appreciate history and the world's cultures.	3 credits	Embedded assessment	Addition of 6 credit English prerequisite
English	The ability to communicate ideas is an essential characteristic of educated individuals. All students are expected to achieve proficiency in both oral and written English.	6 credits	Portfolio and EPortfolio assessment; automated essay scoring	Adoption of national model of outcomes; social media experiment; substantial reduction of basic skills courses
Humanities	The ideals of a liberal education transcend particular major fields and career goals. All students are expected to develop an interest in specific areas within the humanities.	6 credits of junior-level electives; 3 credits of senior seminar	Portfolio and EPortfolio assessment	Course refinement; Modified syllabi to standardize technical writing content
Management	All students are expected to develop the management skills needed to function effectively in an organizational setting.	3 credits	Monitor course evaluations, review syllabi for all GUR courses	Modified syllabi to standardize content
Mathematics	The ability to reason qualitatively and quantitatively, to understand probability, and to apply mathematical models to a variety of circumstances is fundamental to making informed decisions in the modern world.	6 credits, including at least 1 credit of probability and statistics	Review of course results and analysis of placement process	Retention and curricular progression; elimination of the calculus requirement and all basic skills courses
Natural Sciences	The natural sciences provide the basis for our knowledge of the physical universe and for technological progress. All students are expected to develop a thorough understanding of at least one laboratory science.	7 credits, including at least 1 credit of lab	Student transcript analysis to assess performance and scheduling	Modify syllabi, change physics requirements to improve placement
Physical Education	Physical education conveys to students the importance of good health and fitness through planned exercise and recreational activities.	2 credits	Monitor student satisfaction	Course refinement
Social Sciences	An understanding of the social sciences is essential in order to understand the economic, social, and political forces at work in our world.	6 credits	Student transcript analysis	Addition of social science courses for students

Under the same framework of outcomes-based change, a second writing course for first-year students has been added. This course was implemented based on the requests of faculty university-wide to increase the writing and oral presentation proficiencies of lower division students, as well as to facilitate the transfer of English composition credits from NJ Community Colleges, where a full year sequence is the norm. In spring 2011, the UCRC and CAA passed a GUR change that includes making this course a pre-requisite to any cultural history course. Every program on campus recognized the value in a second writing course and advised students to take it. At present, first-year writing at NJIT is designed and assessed in accordance with *WPA Outcomes Statement for First-Year Composition*, the national outcomes statement designed by

the Council of Writing Program Administrators, as well as with the *Framework for Success in Postsecondary Writing* endorsed by the Council, the National Council of Teachers of English, and the National Writing Project; as analyzed in Chapter 14, course outcomes are assessed by a portfolio system that has been documented, as is the case with the information literacy initiative described in Chapter 11, in national and regional presentations and peer-reviewed publications. Along with the new writing curriculum, the information literacy initiative analyzed in Chapter 11 is an integral part of first-year writing. Similar feedback from faculty and administrators as well as the assessment of the Department of Mathematical Sciences has recently led to improvements in the math GUR.

**REVISING THE MATH GUR:** At a meeting on April 13, 2011, the Faculty Council, together with the faculty and instructional staff, reviewed and approved changes to the mathematical science requirement of the GUR. The chair of the department desired to retain the goal of the GUR that the ability to reason qualitatively and quantitatively, to understand probability, and to apply mathematical models to a variety of circumstances remained fundamental to decision making in the modern world. However, the need for all admitted students to demonstrate proficiency in calculus was no longer required across all degree programs. This change, approved by the faculty and instructional staff, reflects a desire by the NJIT community to revisit and modernize the GUR to ensure that the needs of all undergraduate majors are addressed. To assure that students have the knowledge and skills needed to compete in a global environment of the 21<sup>st</sup> century, a comprehensive GUR review is needed to validate that which is currently in place and to design that which will yield a meaningfully cohesive force for undergraduate students.

**ASSESSMENT OF THE GENERAL UNIVERSITY REQUIREMENTS:** Assessment of the GUR, analyzed in Chapter 14, is achieved through the use of locally-developed methods and nationally-based tests. A significant assessment policy was unanimously approved by the Undergraduate Curriculum Review Committee on January 23, 2012, that all syllabi must have identified course learning goals and plans for assessment of student learning. To ensure that present undergraduate courses offered in support of a major adhere to this policy, the committee agreed that articulation of learning outcomes and demonstration of their assessment would become part of the NJIT Program Review Process described in Chapter 14. As well, the committee agreed that the GUR would itself be considered a program; as such, each of the nine GUR disciplines identified in Table 12.0 has been sequenced into the program review process. On-going demonstration of undergraduate achievement of the NJIT Core Competencies—writing, reading and critical thinking; quantitative reasoning; and information literacy—will thus be assured by this new policy.

**CONCLUSIONS:** Working Group 7 was charged to determine compliance with MSCHE Standard 12: General Education. The Working Group found that NJIT had achieved emerging excellence in the following areas: creation of a substantial program of general education to enhance students' intellectual growth; implementation of a program of general education where the skills and abilities developed in general education are applied in the major; implementation of the study of values, ethics, and diverse perspectives; accountability of institutional requirements assuring that, upon degree completion, students are proficient in oral and written communication, scientific and quantitative reasoning, and technological competency; web-based communication of general education requirements in official publications; and assessment of general education outcomes within the institution's overall plan for assessing student learning.

**STRATEGIES FOR THE FUTURE:** After extensive deliberation on the university's commitment to its program of general education, NJIT has identified the following area of improvement. These two areas will be integrated into the strategic planning process:



1. NJIT will continue its successful practice of incremental and continuous GUR improvement to strengthen the NJIT mission and represent the strengths of the faculty and instructional staff; as such, the process of on-going GUR review will ensure content relevance, promote interdisciplinary inquiry, and sustain innovative programs such as information literacy;
2. NJIT will continue to design, develop, and evaluate Learning Communities for first-time, full-time students.

## CHAPTER 13. NJIT RELATED EDUCATIONAL ACTIVITIES

**STANDARD ADDRESSED:** This chapter addresses Standard 13 of the *Characteristics of Excellence in Higher Education*: Related Educational Activities.

**EXECUTIVE SUMMARY:** Extending the analysis offered in Chapter 12, NJIT's focus on students includes the following related educational activities: systematic procedures for identifying students who are not fully prepared for college level study in mathematics and communication; continuing professional education; alignment of non-degree certificate programs with the institutional mission; design and use of non-credit offerings consistent with NJIT's mission; use of MSCHE approved branch campus at Beijing University of Technology to extend learning opportunities; experiential learning activities; and analysis of the ways in which distance learning courses meet institution-wide standards—for quality of instruction, articulated expectations of student learning, academic rigor, and educational effectiveness—in accordance with the 2011 MSCHE *Interregional Guidelines for the Evaluation of Distance Education Programs (Online Learning)*.

**INTRODUCTION:** Adhering to the institutional assessment framework defined in the *Characteristics of Excellence in Higher Education*—as well as the *Interregional Guidelines for the Evaluation of Distance Education Programs (Online Learning)*—NJIT's programs and activities are characterized by well-designed content, focus, location, mode of delivery, and sponsorship.

NJIT is an institution devoted to all educational activities related to mission fulfillment. In the period from 2002 to the present, NJIT has continuously strengthened its offerings and technologies and has validated the systems and protocols it deploys to ensure a high quality of learning and staunch integrity of its learning environments across time and circumstance. As the university grows, so does its commitment to continue to serve disparate cohorts of learners, from K-12 through professionals returning for graduate degrees and certifications. With the increased use of social networks, web-based learning objects, and the expansion of databases, NJIT has provided the resources, guidance, and support—both technologically and pedagogically—for students to succeed in an information-driven environment.

**BASIC SKILLS AND THE TASK FORCE ON UNDERGRADUATE RETENTION AND GRADUATION:** As has historically been the case, during the fall of 2010 all incoming first-year students and transfer students who had not transferred the General University Requirements (GUR) in mathematics were required to take a mathematics placement exam. The exam consisted of four different parts designed to assess students' abilities in standard high school mathematical concepts such as algebra, trigonometry and geometry. Based on the exam, students were placed directly into a GUR satisfying course specific to their major, or into a basic skills (remedial) non-credit course. All incoming first-year students and transfer students who had not transferred the GUR in English composition were placed into a single basic skills non-credit writing course, a traditional writing course, or an honors writing course based on the SAT Writing Section score, its ACT equivalent, or a score on two essays evaluated by the Criterion® Online Writing Evaluation Service. Should an incoming student challenge composition placement, the student was invited to submit two essays to the Criterion system, achieve the designated placement score, and be placed into a credit-bearing class. Programs and procedures to ensure that admitted international students lacking English proficiency—as well as “Generation 1.5” students, those who have immigrated to the United States, completed their secondary education here, yet remain challenged by written English—attain a level of proficiency conducive to academic and professional success are provided by the English as a Second Language (ESL)

program, located in the Department of Humanities. All placement records are maintained by the Office of Institutional Research and Planning.

While NJIT has established systematic procedures for identifying students who are not fully prepared for the university, an investigation of remediation rates was undertaken in the spring of 2011. The NJIT investigation attended especially to the rising costs of remediation and lackluster graduation rates evident in *The Report on the Governor's Task Force on Higher Education*, released on January 4, 2011. The report explicitly states that workforce and economic development in New Jersey would be strengthened by a study undertaken to analyze the extent of the cost of remediation at its colleges and universities. Further, the report recommends that plans be developed to address the issue. This recommendation is especially relevant to NJIT, identified in the report as the state's only public institution devoted primarily to advanced instruction and research in the applied sciences and technology. Attendant to NJIT's social mission, the report also praised NJIT for its dedication to increasing the number of low-income students preparing for college. Important in the report is the connection between NJIT's unique position in the state, its dedication to equity, and its responsibility to increase the state's economic competitiveness.

To ensure a clear understanding of the complexities of educating students in fields requiring advanced mathematics, science, and language skills, on February 3, 2011, President Altenkirch created a Task Force on Undergraduate Retention and Graduation. The Task Force was charged to examine recent national findings on college completion rates, benchmark NJIT's graduation rate, and identify strategies to improve that rate. The *Final Report of the Task Force on Undergraduate Retention and Remediation* is reflective of the Governor's Task Force. The report, issued on May 15, 2011, explicitly recommended NJIT examine and improve the placement rate of students into credit-bearing courses and develop an evidence-based plan to reduce substantially the remediation rate for first year students. Following a system of studies similar to those conducted in 2008 to reduce substantially the remediation rates in English Composition while maintaining successful rates of course completion—studies undertaken under the direction of the Vice President for Academic and Student Services and the Dean of the College of Science and Liberal Arts—a plan has been developed to reduce both the remediation rate and the number of basic skills courses offered by the Department of Mathematical Sciences.

**INNOVATION THROUGH LEARNING COMMUNITIES:** As analyzed in Chapter 8, concurrent with the work of the Task Force on Retention and Graduation is the Community Connections initiative planned for the fall of 2011. As students transition to university life, their experience is more likely to be positive and successful if they gain the support they need. Learning Communities—designed, managed, and assessed under the direction of Associate Provost Dr. Judith Redling—engage students within a network of faculty, advisors, and peer mentors focused on facilitating this transition and enhancing their learning experience. This system of engagement—and rapid assessment of student work in mathematics and English composition—will be important to retention of first-year students during a period in which remediation rates are decreasing.

**CONTINUING PROFESSIONAL EDUCATION:** NJIT is a proven pioneer in innovation and advancement, and the resources associated with Continuing Professional Education play a leadership role in the university's commitment to lifelong learning. Each year CPE provides oversight as part of the education of approximately 9,000 students in degree programs and 1,046 professionals who study through online learning and non-credit courses. With an orientation of corporate education and workforce development, CPE synthesizes interdisciplinary and technologically enhanced teaching and learning initiatives and programs that occur throughout NJIT and makes all these available to adults 24 years and older who are non-traditional students

who typically study part-time. With a staff of seven professionals, CPE is expertly led by the Associate Vice President of Continuing and Distance Education, Dr. Gale Spak.

**CERTIFICATION PROGRAMS AND NON-CREDIT OFFERINGS:** Existing efforts for certificates have both centralized and de-centralized components. Graduate Certificates are the most important source of certificates at NJIT. Graduate Certificates are 12-credit/4 course packets of learning in specific highly employable subjects and are comprised of existing NJIT graduate courses from across all NJIT colleges and schools. The slate of graduate certificates offered changes each year. All key academic decisions and academic advisement to students are made by the departments and faculty in which the academic courses are housed. In online programs, overarching guidance and policy recommendations originate from the University Distance Learning Advisory Committee, whose membership is drawn from faculty representatives of each NJIT college or school. Two centralized support service units assist and coordinate graduate certificates: Continuing Professional Education and Instructional Technology and Media Services (ITMS). In CPE, centralized responsibilities include recruitment of students, assistance to students through the admission phase and then, once registered, ombudsmanship regarding various non-academic tasks (e.g., registration). In ITMS, centralized responsibilities include conduct of professional development courses for faculty and instructional staff to hone their skills as online instructors and personalized assistance and mentoring of faculty in the up-front work to create quality online classes. Future directions for Online Programs and Graduate Certificates both involve scalable growth and continuous quality improvement including appropriate incorporation of new educational technologies to advance learning.

Professional development, non-credit courses are also coordinated by CPE. The list of courses is responsive to the role NJIT plays in workforce development for the state and region. As such, courses are designed to offer state-of-the-art applications in technology, computer science, and project management.

**BRANCH CAMPUSES AND BEIJING UNIVERSITY OF TECHNOLOGY:** In 2004 NJIT and Beijing University of Technology (BJUT) signed an agreement to bring the M.S. in Engineering Management offered by Newark College of Engineering to the BJUT campus. BJUT is a leading engineering school in China under the administration of the Beijing Municipal Government. This joint program has been designed to train a future generation of high-quality, skillful and technically competent managers to serve the needs of the growing Chinese economy. Courses are taught by both NJIT and BJUT faculty and students receive NJIT degrees. The first group of 14 students started the program in the fall 2007 and there are approximately 90 students enrolled. In May 2009, the Middle States Commission on Higher Education visited the BJUT campus and reviewed the program. Historically, this is the first such program in China to apply for MSCHE review. On June 25, 2009, NJIT received confirmation from MSCHE that the additional location at BJUT was within the scope of NJIT's accreditation.

A collaborative agreement between NJIT and Amity University, a private university located in India, was submitted on June 21, 2011, and approved by the MSCHE Executive Committee for Substantive Change on August 30, 2011. The agreement allows students to earn a Master's Degree in Business Administration and Master of Science Degree by beginning coursework at Amity and transferring to NJIT for in-residence courses.

**THE ROLE OF EXPERIENTIAL LEARNING:** Experiential learning is an educational cornerstone at NJIT spanning numerous programs from pre-college through graduate studies. The majority of experiential learning initiatives are administered through the Division of Career Development Services (CDS). CDS is a value-added contributor to the career planning and professional

preparation of NJIT students and graduates. CDS is the primary provider of formal NJIT experiential education programs, including cooperative education, internships, and civic engagement. Annually, more than 1,700 students participate in some form of experiential learning. All CDS experiential learning options link direct, hands-on experience with knowledge acquired in the classroom, providing a comprehensive experience for students during their academic progress. At NJIT, options for experiential learning include, but are not limited to, workplace assignments, on campus research projects, community and public service, and capstone course projects.

The NJIT co-op program gives students the advantage of experience that is major-related and integrates reflection, critical analysis, and values clarification as additional learning components. Today's employers seek graduates, who are technologically proficient, possess developed communication and teamwork skills, and who understand the business environment. Students who successfully undergo experiential education are simply more fully prepared graduates. Co-op at NJIT is an academically integrated model and students are granted three credits upon the successful completion of the requirements for each co-op course.

This year at NJIT, over 1,300 students improved their leadership, professional, and technical skills through active engagement in a diversity of civic and community projects. Students used their abilities, talents and enthusiasm in volunteer or paid internship projects such as mentoring and teaching computer skills to public and charter school students, helping prevent homelessness by volunteering at a local shelter, teaching children to read, researching the use of green and energy efficiency strategies in affordable housing, conducting fund-raising drives to contribute financial support to disaster victims, and leading the fight to prevent drug abuse.

In 2010, NJIT received designation as a member of the President's National Higher Education Community Service Honor Roll under the auspices of CDS for a second time. The university was recognized for implementing three exemplary community service programs; the Wachovia/NJDCA Housing and Community Development Scholars Program; the Civic Engagement Computer Center@ NJIT, and the NJIT Annual "Community of Caring" Volunteerism Campaign.

Capstone Projects at NJIT call upon students to help develop solutions for real-world needs in many fields. Capstone courses are offered through many academic majors. One outstanding example is the capstone program initiated within the College of Computing Sciences. Since its inception in 2002, more than 1,800 students have completed over 330 projects ranging from large corporations to smaller high-tech firms. The more than 200 industry sponsors have included Microsoft, Johnson & Johnson, PSE&G Inc., NASA and the National Science Foundation.

**ONLINE LEARNING AND HALLMARKS OF QUALITY:** NJIT is committed to adhering to the hallmarks of quality identified by the Middle States Commission on Higher Education. As such, NJIT has a demonstrated commitment to online learning to support traditional and distance learning initiatives that dates to the hallmark publication of *The Network Nation: Human Communication via Computer* in 1978 by NJIT Distinguished Professor Emerita Starr Roxanne Hiltz and Distinguished Professor Emeritus Murray Turoff. Since that time, NJIT has documented planning and evaluation processes evident today in the innovations of the Teaching, Learning and Technology Committee and the Distance Learning Advisory Committee. Under the leadership of the Associate Vice President of Continuing and Distance Education, online learning is incorporated into the institution's systems of governance and academic oversight. That oversight is part of a comprehensive structure of the Division of Information Services and



Technology, led by David F. Ullman, Associate Provost for Information Services & Technology and Chief Information Officer.

Adherence to evaluation procedures approved on February 24, 2011, as the *NJIT Framework for Quality Assurance in ELearning*—an innovative framework designed to achieve an evidence-based model for continuous quality improvement centered on research, student learning, and quality—assures that curricula for the institution’s online learning offerings are coherent, cohesive, and comparable in academic rigor to programs offered in traditional instructional formats. Because the *NJIT Framework for Quality Assurance in ELearning* deploys a quality rubric and scorecard based on the Sloan-C Consortium—a national recognized quality assurance system—NJIT faculty and instructional staff evaluate the effectiveness of its online offerings, including the extent to which the online learning goals are achieved, and uses the results of its evaluations to enhance the attainment of the goals as part of the NJIT Program Review Process.

Workshops and seminars hosted by Instructional Technology and Media Services (ITMS)—the campus’s premiere resource offering support in technological applications, devices, and one-on-one training—assure that the faculty and instructional staff responsible for delivering online learning curricula and evaluating the students’ success in achieving the online learning goals are appropriately qualified and effectively supported. With support by both ITMS and the Associate Vice President of Continuing and Distance Education, the institution provides a rich array of on-line materials to support students enrolled in online learning offerings. As the record of institutional commitment to online learning demonstrates, NJIT has provided sufficient resources to support and expand its online learning to achieve mission fulfillment. Through its formal committee structure, access to institutional infrastructure and planning, and articulated quality assurance plan, NJIT has assured the integrity of its online learning offerings.

To achieve further compliance with regional and state demands, NJIT has applied for licensing to offer online courses/programs in all states. Pending licensing information, and applicable state agencies, is published on the web.

**CONCLUSIONS:** Working Group 7 was charged to determine compliance with MSCHE Standard 13: Related Educational Activities.

In the area of basic skills, the Working Group found that NJIT had achieved emerging excellence in systematic procedures for identifying students who are not fully prepared for college level study; provision of or referral to relevant courses and support services for admitted under-prepared students; and remedial or pre-collegiate level courses that do not carry academic degree credit.

In the area of certificate programs, the Working Group found that NJIT had achieved emerging excellence in the following areas: published program objectives, requirements, and curricular sequence; program learning goals consistent with national criteria; available and effective student support services; and academic oversight assures the comparability and appropriate transferability of courses completed within a certificate program applicable to an NJIT degree program. The Working Group found that NJIT has met the competency in offering certificate programs, consistent with institutional mission, that have clearly articulated program goals, objectives, and expectations of student learning and that are designed, approved, administered, and periodically evaluated under established institutional procedures.

In the area of experiential learning, the Working Group found that NJIT had achieved emerging excellence in communicating published and implemented policies and procedures defining the

methods by which college credit can be granted for co-op experiences. Special praise was given to the high quality of programs for experiential learning coordinated by the Division of Career Development Services.

In the area of non-credit offerings, the Working Group found that NJIT had achieved emerging excellence in the design, offering, and review of non-credit offerings consistent with the NJIT mission, and that NJIT had clearly articulated program and course goals, objectives, and expectations of student learning designed, approved, administered, and periodically evaluated under established institutional procedures. The Working Group found that NJIT had met the standard of academic oversight to assure the comparability and appropriate transferability of courses, completed within a certificate program that are applicable to a degree program offered by the institution, as well as in periodic assessment of the impact of non-credit programs on NJIT's resources and mission.

In the area of branch campuses, the Working Group found that NJIT had achieved emerging excellence in the following areas: design, delivery, and review of offerings at branch campuses, additional locations, and the instructional sites at Beijing University of Technology to meet the standards for quality of instruction, academic rigor, and educational effectiveness comparable to those of institutional offerings in Newark; and activities and offerings at other locations meet all appropriate standards, including those related to learning outcomes. The Working Group found that NJIT had met the standard of adequate and appropriate support services and periodic assessment of the impact of branch campuses, additional locations, and other instructional sites on NJIT's resources and mission.

**STRATEGIES FOR THE FUTURE:** After extensive deliberation on the university's commitment to basic skills, continuing professional education, non-degree certificate programs, non-credit offerings, international programs, experiential learning, and distance learning, NJIT has identified the following areas of improvement. These three areas will be integrated into the strategic planning process:

1. NJIT will continue to integrate online learning modules into NJIT's overall educational delivery;
2. NJIT will design and use long-term strategies to improve coordination in the availability and deployment of instructional technology in all modes of learning in order to achieve identified learning outcomes and enhance the educational experiences of students;
3. NJIT will continue to develop mechanisms to evaluate and prioritize the undergraduate and graduate certificate programs offerings, with increased involvement of industrial advisory boards of departments, colleges, and schools.

## CHAPTER 14. NJIT ASSESSMENT OF STUDENT LEARNING

**STANDARD ADDRESSED:** This chapter addresses Standard 14 of the *Characteristics of Excellence in Higher Education*: Assessment of Student Learning.

**EXECUTIVE SUMMARY:** Decision-making at NJIT, as MSCHE reviewers have recognized, is driven by continuous assessment of institutional effectiveness at multiple levels, including comprehensive coverage of student learning outcomes. Varied, exemplary, and unique, hallmark assessment practices include the first-of-its-kind electronic storage of student design work in the College of Architecture and Design, the portfolio approach to assess student writing ability in the College of Science and Liberal Arts, and the NJIT university-wide course evaluation system. To unify assessment practices, the university has launched the NJIT Program Review Process. These practices, augmented by a repertoire of educational experiments undertaken in accord with measures advocated by the Voluntary System of Accountability, strengthen student learning assessment at NJIT.

**INTRODUCTION:** Adhering to the institutional assessment framework defined in the *Characteristics of Excellence in Higher Education*, NJIT's assessment of student learning demonstrates that, at graduation, or other appropriate points, the institution's students have knowledge, skills, and competencies consistent with institutional and appropriate higher education goals.

NJIT is an assessment-based university in terms of educational effectiveness. The emergence of the NJIT *Strategic Plan, 2010-2015* and the decennial MSCHE evaluation created a perfect opportunity to unify student learning assessment at NJIT under a comprehensive framework. NJIT has a cohesive plan for the measurement of student learning assessment, and mechanisms are in place to ensure assessment is used to drive curricular change for the benefit of students. Expected student learning outcomes have been articulated at all levels and are consonant with both the NJIT mission, the degree programs accredited by ABET, AACSB, and NAAB, and the MSCHE *Characteristics of Excellence*. The Program Review Process, an initiative of the Office of the Provost, ensures that data-driven assessment activities are organized and sustained. The Office of Institutional Research and Planning plays a key role in collecting and analyzing data, and distributing results of those analyses to appropriate shareholders for consideration and recommending action.

NJIT has a history of performing innovative outcomes research of student performance, and many faculty members from various disciplines have published in this area. Hence, the university is an exception to the finding by George Kuh and Stanley Ikenberry, *More Than You Think, Less Than We Need*, that research universities are challenged by faculty engagement and that these institutions were unlikely to have common learning outcomes for all undergraduate students. NJIT is presently poised to become a national leader among its benchmark science and technology universities in the area of student learning assessment. This orientation to student learning assessment is due both to the use of assessment to demonstrate proficiency and the analysis of assessment results to develop experimental heuristics for curricular improvement.

**EXEMPLARY ACCREDITED PROGRAM:** Accredited by the Association to Advance Collegiate Schools of Business (AACSB), the School of Management (SOM) has developed and implemented an assurance of learning system. Broad learning goals and specific, measurable outcomes are established in accordance with the NJIT mission and institutional learning goals. To assess the level of faculty support of learning goals, course syllabi are collected each semester and analyzed.

A variety of mechanisms are used to measure learning outcomes—from standardized tests to group exercises and embedded questions in exams. Assessment is undertaken for all fundamental core courses at both the undergraduate and graduate levels. For example, data demonstrating knowledge in business concepts and an ability to apply these concepts to solve business problems is collected using the Major Field Test (MFT) in Business developed by ETS. National standardized tests allow comparison of student skill levels to national levels in subject areas such as accounting, finance, quantitative methods, management, marketing, legal and ethical issues, and international business. Pre-and post-data measuring communication skills is collected and assessed according to AACSB standards, allowing evaluation of change in skill level over the course of four years. Current case studies and written assignments are used to evaluate level of ethical reasoning and understanding of global issues and writing skills. SOM uses multiple measurement cycles to gain a longitudinal view of student skill level. Cycles range from every semester to bi-annually depending on need.

Data collected is used for continuous program improvement. In areas where SOM has met performance goals, the goals are reevaluated and, when appropriate, increased. In areas where goals are unmet, changes are implemented and items are measured again. Changes that do not lead to improved abilities are revisited. Assessment results are shared regularly with faculty and feedback is solicited. The SOM program is evolving from being one that is project driven to one that is systemic and focuses on continued process improvement.

**VOLUNTARY SYSTEM OF ACCOUNTABILITY:** NJIT is a member of the Voluntary System of Accountability (VSA), an initiative developed by the higher education community to provide useful information for students during the college search process and to demonstrate accountability to the public. VSA sponsoring associations—the Association of Public and Land-grant Universities and the American Association of State Colleges and Universities—collectively represent over 520 public institutions that enroll 7.5 million students and award 70% of bachelor's degrees in U.S. each year. NJIT actively participates in the measurement of educational outcomes and facilitates the identification and implementation of effective practices as part of institutional improvement efforts. To that end, NJIT maintains a VSA-sponsored College Portrait through a common web report on student and campus characteristics, cost of attendance, success and progress rates, campus safety, class size, student experiences on campus, and student learning outcomes. To measure learning outcomes associated with the General University Requirements (GUR), NJIT uses the *ETS Proficiency Profile*, one of three standardized assessments selected by the VSA, to assess student learning in writing, reading, critical thinking, and quantitative reasoning. Because of its unique mission, NJIT also uses the ETS *iSkills* test as a measure of information literacy.

**NJIT PROGRAM REVIEW PROCESS AND DEGREE PROGRAMS:** Elise Scanlon, former executive director of the Accrediting Association of Career Colleges and Schools, has recently contributed to an edited volume, *Reflections on the Future of Accreditation*, offering three lessons in successful accountability practices: a comprehensive approach to assessment requires that information on student learning be considered within context; accountability has the most value if it is used to improve the quality and effectiveness of the institution; and student learning is, at once, the most important and most challenging outcome for post-secondary educators to measure.

In both its prior decennial and periodic review, MSCHE has recognized that decision making at NJIT is manifestly driven by continuous assessment of institutional effectiveness at multiple levels, including comprehensive coverage of student learning outcomes. The NJIT planning and assessment mechanism, *ViSta*, provided a uniform, thorough-going culture of evidence that

characterizes the institution. From 2000 through 2009 NJIT used a rigorous program review process that functioned as a program audit. Criteria for the review included faculty qualifications and scholarly productivity, research dollars, teaching loads, cost per credit hour, enrollment, retention and graduation rates, time to degree, degrees awarded, courses offered, and so forth. As an audit process by which inefficient or underutilized programs could be terminated, departments were reluctant to participate. The process offered little that would help instructors design a gap analysis—a determination of student learning and justified curricular revision. Simply put, the old program review process was not robust enough to provide a framework to assess and monitor student learning outcomes. The new program review process implemented in 2010 changes the focus from a contentious audit to a forward-looking model: one that helps the university determine that students have knowledge, skills, and competencies consistent with NJIT goals. The new program review process is enabling NJIT to determine that, at graduation, students have achieved goals appropriate to New Jersey’s science and technology research university.

In anticipation of the 2010 decennial review, President Altenkirch, Provost Gatley, Senior Administrators, and the Deans recognized that the assessment of student learning—no matter how well done for program accreditation by ABET, AACSB, NAAB, or the CSLA assessment of student learning plan—existed as distinct silos. Two disadvantages became apparent as colleagues discussed the potential for a unifying framework: programs were not learning best practices from each other; and the diversity of strategies did not yield a uniform university structure for student learning assessment. Concurrent with the *Strategic Plan, 2010-2015*, key shareholders, coordinating their efforts under the direct leadership of President Altenkirch and Provost Gatley with the support of Institutional Research and Planning, drafted and finalized the NJIT Program Review Process. The new process, boldly innovative and rigorously demanding, benefits by the three lessons learned by Scanlon.

The NJIT Program Review Process begins with the Academic Affairs Core Values: that education is a lifelong activity; that the call of service should be answered in a variety of community settings; that leadership should be exercised in both professional and citizenship activities; that technology should be applied to improve quality of life; that entrepreneurial inquiry should be encouraged to foster creative growth; that a sense of civility should be upheld that embraces respect and candor; and that diversity should be celebrated in all cultural contexts. Dispositional and attitudinal in nature, these Academic Core Values have been designed to resonate with the NJIT Core Values analyzed in Chapter 6.

The NJIT Institutional Learning Goals—research-based inquiry, ethical conduct, economic opportunity, collaboration, and engagement—constitute the unifying framework for all NJIT degree programs and, as shown below, the General University Requirements. The specific course goals, mapped to the program goals that are, in turn mapped to the NJIT Institutional Learning Goals—are then used to drive performance assessment, evaluation of assessment results, and the implementation of change.

Under the NJIT Program Review Process, all NJIT degree-granting programs, from bachelor to doctoral level, undergo program review, regardless of program accreditation affiliation by ABET, AACSB, and NAAB. Operating according to a strict time line, NJIT has field-tested the system and has begun the review process. With ten programs reviewed each semester, by the spring of 2015 all NJIT degree programs will have been assessed according to a formal structure. That structure emerges in two phases. In the first part, one page summaries—NJIT Program Review Reports—were developed, reviewed, and finalized for each NJIT degree granting program. That phase has been completed. In the second phase, each program director, assisted by Institutional Research



and Planning, submits a written report documenting the following components of each degree program: general program information on graduation rate, retention rate, and average grade point by student level; the program mission and goals as mapped to the NJIT Institutional Learning Goals, including a mapped matrix of the required core courses as they address the program goals; the identified learning outcomes, including the assessment plan, actual practice to date (including submission of the program's NJIT Information Literacy Initiative analyzed in Chapter 11) and potential use of the *NJIT Framework for Quality Assurance in ELearning* (analyzed in Chapter 13); and the ways that student learning assessment has been used to implement needed curricular change.

The review process has been field tested with reviews conducted by a new standing committee, the Subcommittee on Assessment, a committee of associate deans of each of the colleges and schools and leading educators reporting to the Committee on Department and Program Assessment. The following programs were empirically evaluated with an outcomes-based rubric by the Subcommittee and achieved passing scores: the BS in Biomedical Engineering; the BS in Civil Engineering; the MS in Professional and Technical Communication; and the entire cohort of degree programs offered by the College of Architecture and Design. During the process, the *NJIT Framework for in ELearning* was also field-tested on the MS in Professional and Technical Communication, a degree program offered entirely on-line. Because the assessment framework is undertaken on line, evaluations can be undertaken asynchronously, then discussed and finalized in a meeting of the Subcommittee. While the Moodle open source platform was used for the field test, a new platform is currently under development to facilitate review of the one-page reports and the more comprehensive reports. In essence, the review process is the embodiment of Figure 14.0.

**NJIT PROGRAM REVIEW PROCESS AND THE GENERAL UNIVERSITY REQUIREMENTS:** As analyzed in Chapter 12, the General University Requirements serve NJIT as the foundational curricula encompassing the necessary preconditions for success in undergraduate disciplines, with special attention to the delivery of curricula that establish a devotion to lifetime intellectual discovery and personal development. The GUR requirements are intended, therefore, to provide an educational grounding for students—a set of educational experiences harmoniously attuned to the mission of NJIT and its responsibilities to its constituents. Understood as its own program, assessment of the GUR falls naturally into the NJIT Program Review Process.

While the institutional learning goals of research-based inquiry, ethical conduct, economic opportunity, collaboration, and engagement are assessed in degree programs, NJIT has elected to focus on three areas of student learning to be assessed both by locally developed and nationally-based measures: Writing, Reading, and Critical Thinking; Quantitative Reasoning; and Information Literacy. To allow national comparison of student performance that fulfills the NJIT commitment to the Voluntary System of Accountability, the *iSkills* and *ETS Proficiency Profile* assessments have been used, along with locally developed measures such as common examinations in mathematics and course portfolios in writing classes, to afford a precise understanding of student performance levels.

**REPRESENTATIVE RESULTS OF NJIT ASSESSMENT OF STUDENT LEARNING:** NJIT is firmly committed to the instruction of writing. Measurement of writing ability occurs during the first year, junior year, and senior year for all students. Experiments with automated essay scoring (AES) in 2008 led to a substantial rate of decrease in remedial rates of students—from 30% (n = 254) in 2007 to 14% (n = 105) in 2010. An AES system, Criterion® Online Writing Evaluation Service, serves as a way for students to challenge their placement decisions and has been used to create an early warning system for admitted students and, as analyzed in Chapter 13. The system

began to demonstrate its potential in the fall of 2010 when 22% ( $n = 168$ ) of students admitted placed into first-year writing ( $n = 747$ ) appeared to be in need of extra help in the Writing Center based on their Criterion scores. Of the 161 of these students who completed the class, 83% ( $n = 133$ ) earned grades of C or above. Such E-Testing appears to allow students to be identified early in the semester and, without non-credit remediation, complete the course successfully. As well, because Criterion is embedded within first-year writing, pre-post analysis is an added value. In the fall of 2010, statistically significant differences were recorded between the first administration of the AES in September ( $M = 7.09$ ,  $SD = 2.92$ ) and the final administration December ( $M = 7.69$ ,  $SD = 2.4$ ). In the fall of 2011, students with complete score sets ( $n = 99$ ) earned even higher scores ( $M = 8.44$ ,  $SD = 1.46$ ) during the first weeks of class; scores during the final weeks of class showed statistically significant lower scores ( $M = 8.18$ ,  $SD = 1.57$ )—though, again, both sets of scores exceeded the traditional competence score of 7.

Since 1996, experiments in the assessment of first-year writing performance have been analyzed in the College of Science and Liberal Arts in the Department of Humanities. In the fall of 2010, a sampling plan for first year students demonstrated that, at the end of the first writing course, students met and achieved the designated proficiency score on the variables of rhetorical knowledge, critical thinking, writing process, and knowledge of conventions in a model that achieved internal consistency ( $R^2 = .817$ ,  $F(4, 112) = 56.28$ ,  $p < .001$ ). Similar rates of internal consistency, along with designated proficiency scores, were achieved with a smaller sampling plan in the fall of 2011 ( $R^2 = .658$ ,  $F(4, 55) = 26.44$ ,  $p < .001$ ).

As well, initial experiments in EPortfolios with first-year students demonstrated that students engaging in digital writing out-performed students working in traditional print settings; based on these preliminary findings, a digital platform has been designed to strengthen portfolio scoring. That platform was operationalized in the fall of 2011. In its field test, students achieved designated proficiency scores on traditional variables as well as on a new variable, composing in electronic environments. The internal consistency of the EPortfolio model was higher than that achieved in the traditional portfolios in the fall of 2010 and the fall of 2011: ( $R^2 = .852$ ,  $F(4, 45) = 34.04$ ,  $p < .001$ ).

At the junior level, records of student performance in technical writing reveal that, in a comparison of student work in 2004 and 2009, students have increased their performance in the variables of style, usage, task knowledge, relevant content, adapted tone, and graphic cohesion, and overall performance. Because technical writing is a well-subscribed GUR course, a statistically valid record of student improvement exists at the junior year. At the graduate level, a model assessment program has been built in the MS in Professional and Technical Communication. There, student EPortfolios are maintained and assessed each spring. Recent presentations and publications associated with research in writing assessment have been presented at the MSCHE Annual Conference (2010), the Conference on College Composition and Communication (2011), and published in the *Journal of the Council for Programs in Technical and Scientific Communication* (2010) and in *Assessment in Technical and Professional Communication* (2010).

NJIT was an early-adopter of information literacy instruction and measurement, as analyzed in Chapter 11. Information literacy is measured for all first-year students in the writing portfolio, and research associated with that effort has been published in the *Journal of Academic Librarianship* (2007). The relationship between portfolios and the ETS *iSkills* assessment was the subject of an *ETS Research Report* (2008). NJIT remains a featured national institution on the ETS homepage for its leadership role in teaching and assessing information literacy.

Such efforts have led to the continued use of *iSkills* as a measure of information literacy in the GUR. In the spring of 2011, 216 senior students took *iSkills*, and 112 students achieved the score of 260—judged by an international group of reviewers to be a fundamental level of information and communication literacy. The mean score for NJIT seniors ( $n = 255$ ,  $SD = 84.6$ ) is just below the designated score, an indication that, with just a bit more exposure to information literacy, senior students may be expected to achieve competency in this area. In the fall of 2011, a smaller group of representative first-year students ( $n = 68$ ) were tested with results similar to those of the senior class ( $M = 252$ ,  $SD = 58.4$ ). Because the expected gains in performance from first to senior year are not in evidence, such similar rates of achievement provide impetus for curricular examination.

Significant in the *iSkills* assessment is its strong correlation, identified in spring of 2011, to scores on the *ETS Proficiency Profile* ( $r = .762$ ,  $p < .001$ ). Results of the *ETS Proficiency Profile* reveals that NJIT seniors ( $M = 452.46$ ) perform comparably with benchmark doctoral / research universities ( $M = 448.46$ ). Correlations between GPA and the *ETS Proficiency Profile* ( $r = .386$ ,  $p < .001$ ) also suggest that the standardized test is related to overall performance. Current analyses confirm that the tests appear to be unbiased in terms of gender and ethnicity, an important test qualification for use with NJIT's diverse student body. Assessment of first-year students with the *ETS Proficiency Profile*, however, remains a challenge, with very few students ( $n = 13$ ) taking the test at home. This finding suggests that assessments that are tied to a course—such as Criterion and *iSkills* in first-year writing—are much more likely to become part of the assessment portfolio at NJIT.

Indirect assessments—such as the National Survey of Student Engagement and its Special Interest Group Writing Survey—provide a wealth of further information about NJIT students. Results from the NSSE survey in 2008 and 2010 also show that NJIT excels in key areas of classroom interaction such as collaborative learning for first-year students ( $M = 46$ ,  $p < .05$ ) and seniors ( $M = 53$ ,  $p < .05$ ) compared to the Carnegie Classification peers. In the areas of making classroom presentations (41%), working on collaborative projects (53%), serving as tutors (27%), and discussions of ethnic diversity (68%) and ethical values (64%), first-year students reported higher instances of affirmation than members of the Special Interest Writing Group and Carnegie Classification peers. In the writing of papers more than 20 pages in length (58%), working with classmates outside of class (72%), serving as tutors (32%), participating in discussions of ethnic diversity (68%), and participating in a culminating capstone experience (50%), NJIT seniors also out-performed members of the Special Interest Writing Group and Carnegie Classification peers. When compared with performance measures such as portfolio scores, NSSE surveys are especially revealing. The achievement of competence in all writing measures, researchers now infer, correspond with reports that students talk to their instructors before drafting begins and that feedback from instructors is common. These elements of the writing process are statistically higher at NJIT than among comparison schools (drafting = 3.47,  $p < .01$ ; feedback = 3.28,  $p < .05$ ).

Similar detailed results and comparisons are related to each of the elements of the integrated assessment model shown in Table 14.0. Each assessment genre yields important information that serves, in turn, to suggest heuristics for innovation. The Learning Communities analyzed in Chapters 8 and 13, for example, are using Criterion® Online Writing Evaluation Service for early warning, and Learning Communities are also using *iSkills* and the *ETS Proficiency Profile* to assess the competencies of first-year students—an assessment that will yield comparison to the performance of senior students. Along with examinations, migration reports help administrators track students as they shift majors. Combined, performance-based examinations and internal

reports can yield important information about the match between student skill and degree program success.

**DISSEMINATING STUDENT LEARNING ASSESSMENT RESEARCH:** In their 2002 review, MSCHE evaluators recommended that NJIT organize a formal dissemination campaign for the wealth of research studies conducted by NJIT investigators. To that end, NJIT has secured a pledge of \$300,000 from the Martinson Family Foundation to host a national conference and begin a web-based journal to foster educational research in science, technology, engineering, mathematics, and communication (STEM-C). Frank Cassidy, former president and chief operating officer of PSEG Power LLC and Chair of the CSLA Board of visitors, has also committed \$200,000 in support of our efforts. These pledges will allow researchers to build on a \$3M National Science Foundation grant—Computation and Communication: Promoting Research Integration in Science and Mathematics, or C2PRISM—to impart and infuse computational methods and tools in a math and science context into high school classrooms in Newark. That work also builds on a second NSF award—Open Knowledge Exchange System: The Application of Socio-Technical Systems Theory to Pre-publication Academic Knowledge Exchange—that re-conceptualizes the process of academic publishing and peer review to increase collaboration. An annual STEM-C conference—Curriculum and Learning Assessment System Studies, the CLASS Project—will be launched in 2012, with an accompanying on-line community curriculum portal that will, over time, evolve into a peer reviewed journal.

Table 14.0. The NJIT Integrated Assessment System

Genre	Form	Audiences	Assessment	Use
<b>Exams</b>	iSkills	Program directors/Academic administration	Assessment of student learning/curricular development/resource allocation	Strengthen information literacy instruction
	ETS Proficiency Profile	Program directors/Academic administration	Assessment of student learning/curricular development/resource allocation	Strengthen GUR
	ETS Major Field Test in Business	SOM program director	Assessment of student learning/curricular development/resource allocation	AACSB accreditation
	NSSE	Senior administration/ chairs	Curricular development/resource allocation	Improve instructional climate through national comparison
	Portfolios	Students and program shareholders	Course and program	Improve instructional climate through criterion measures
<b>Surveys</b>	Course evaluation	Faculty/chairs/dean/ senior administration	Curricular development/ resource allocation/faculty hiring/salary increases	Improve instructional ability
	Enrolling students	Admissions office/deans	Admissions projections and targeting/marketing/ communications plan	Improve admission functions
	Student satisfaction	Student services administration/ academic administration, financial and plant operation administrators	Improving campus life/promoting community/ resource allocation/ advisement/ comparative analysis through Educational Benchmarking, Inc.	Improve campus life
	Graduating students	Student services administration/ academic administration	Assessment of student learning/Curricular development/resource allocation	Improve campus life
	Alumni	Chairs/deans/senior administration	Assessment of student learning/ curricular development/ resource allocation	Improve educational experience
	Employers	Chairs/deans/senior administration	Assessment of student learning/Curricular development/resource allocation	Improve student work preparedness
	Intern supervisors	Chairs/deans/senior administration	Assessment of student learning/Curricular development/resource allocation	Improve student work preparedness
	Educause (IT)	IT department/senior administration	IT service improvement/ resource allocation	Improve IT needs
<b>External Data Systems</b>	PolyDasher	Senior administration	Overall institutional assessment	Improve graduation and retention
	Custems	Senior administration	Overall institutional assessment	Improve engineering retention
<b>Internal Data Systems</b>	Efficiency table	President/provost	Resource allocation	Assess faculty load by program
	Grade distribution report	Chairs/deans/ provost	Academic administration	Strengthen practices to avoid grade inflation
	Enrollment	Admissions/ budget/ provost	Academic administration/ academic planning/ resource allocation/ facilities planning	Improve admissions and resource needs
	Graduation report	Chairs/deans/ provost/ student services	Academic administration/ academic planning	Improve graduation rate
	Retention report	Chairs/deans/ provost/ student services	Academic administration/ academic planning	Strengthen academic program
	Migration report	Chairs/deans/ provost/ student services	Academic administration/ academic planning	Track program comparison
	Retention/ graduation report	Chairs/deans/ provost/student services	Academic administration/ academic planning	Improve graduation rate
<b>Benchmark Comparisons</b>	Diversity report	Provost/student services	Admissions planning	Strengthen diversity
	Comprehensive benchmark report	President/provost	Overall institutional assessment	Improve university performance



**CONCLUSION:** Working Group 4 was charged to determine compliance with MSCHE Standard 14: Assessment of Student Learning. The Working Group found that NJIT had achieved exemplary performance in creating a documented, organized, and sustained assessment process to evaluate and improve student learning. The Working Group also found that NJIT had achieved emerging excellence in the following areas: clearly articulated statements of expected student learning outcomes; assessment results that provide sufficient, convincing evidence that students are achieving key institutional and program learning outcomes; evidence that student learning assessment information is shared and discussed with appropriate constituents and is used to improve teaching and learning; and use of student learning assessment as part of institutional assessment.

**STRATEGIES FOR THE FUTURE:** After extensive deliberation on the university's commitment assessment of student learning, NJIT has identified the following areas of improvement. These two areas will be integrated into the strategic planning process:

1. NJIT will ensure the sustainability of student learning assessment by enhancing the existing model and strengthening the culture of measurement and accountability;
2. NJIT will improve analysis and reporting of data in support of assessment of student learning outcomes to drive curricular transformation and to inform shareholders of assessment results.

## CONCLUSION

As New Jersey's science and technology research university, NJIT is dedicated to accountability. Processes of strategic planning, transparency, and communication have been emblematic of the university's framework for assessing the effectiveness of institutional context and educational effectiveness. The mission of the university is congruent with the emerging *State Strategic Plan: New Jersey's State Development & Redevelopment Plan* to foster targeted job growth, thus preserving the state's critical resources.

To enhance mission penetration, NJIT has retained its commitment to diversity while expanding educational opportunities for students both at home and abroad. There are abundant opportunities for traditional and online instruction, designed for young students recently graduated from high school to mature students advantageously pursuing career advancement. The NJIT educational experience begins with the elementary school students enrolled in the Center for Pre-College Programs, continues with undergraduate and graduate study, and extends through career workforce development. NJIT is capacious in its commitment to education and service.

The university's dedication to economic development and research is equally clear. In a single year, the 86 companies in the NJIT Enterprise Development Center created more than 300 jobs, employed more than 100 students part-time, and posted combined revenue of \$40M. Expansion of the Office of the Senior Vice President for Research and Development has been accompanied by an increase in research expenditures from \$69.1M in 2002 to \$100.5M in 2011. Thematic core areas of integrated research and learning assured that retiring faculty will be replaced with researchers who will serve the university's cohesive future.

Planning, resource allocation, and prudent use of institutional resources have led to sound fiscal management—indeed, to an internal structure so firm that the university has been able to turn its gaze toward Newark itself. In an unprecedented alliance with the city of Newark, NJIT has taken on the role of redeveloper in a project valued at over \$1 billion. The Gateway Project promises to allow Newark enhanced urban renewal. In a period of severe financial constraint, the university has achieved municipal bond ratings of “A1” and “A+”—while taking on a leadership role to benefit its host city.

In areas of governance, NJIT has achieved a comprehensive *Faculty Handbook* revision and has worked to strengthen shareholder collaboration. In areas of curricular reform—from the strengthening of general education to the creation of a uniform system for student learning assessment—the university community has assured solidification of gains by charting the future along a path of continuous improvement. With a commitment to quality that is more than a slogan, NJIT has a documented record reflection that assures its constituency of an overwhelming truth: the NJIT mission is evidenced in all we say and do.

A discernable pattern running through the recommendations made by the working groups is an institutional appetite for continuous improvement. As connections among recommendations are examined, it becomes apparent that processes of integration, communication, and transparency of the university's robust systems deepen the NJIT mission. As has been clear in this decennial report to the Middle States Commission on Higher Education, accreditation is a vehicle by which the NJIT community speaks to the worth of its achievements. As such, this report has documented achievements of which shareholders are proud. A hallmark event for NJIT, that effort is here concluded.